FLIGHT MAGAZINE

FEBRUARY 1956
35 cents

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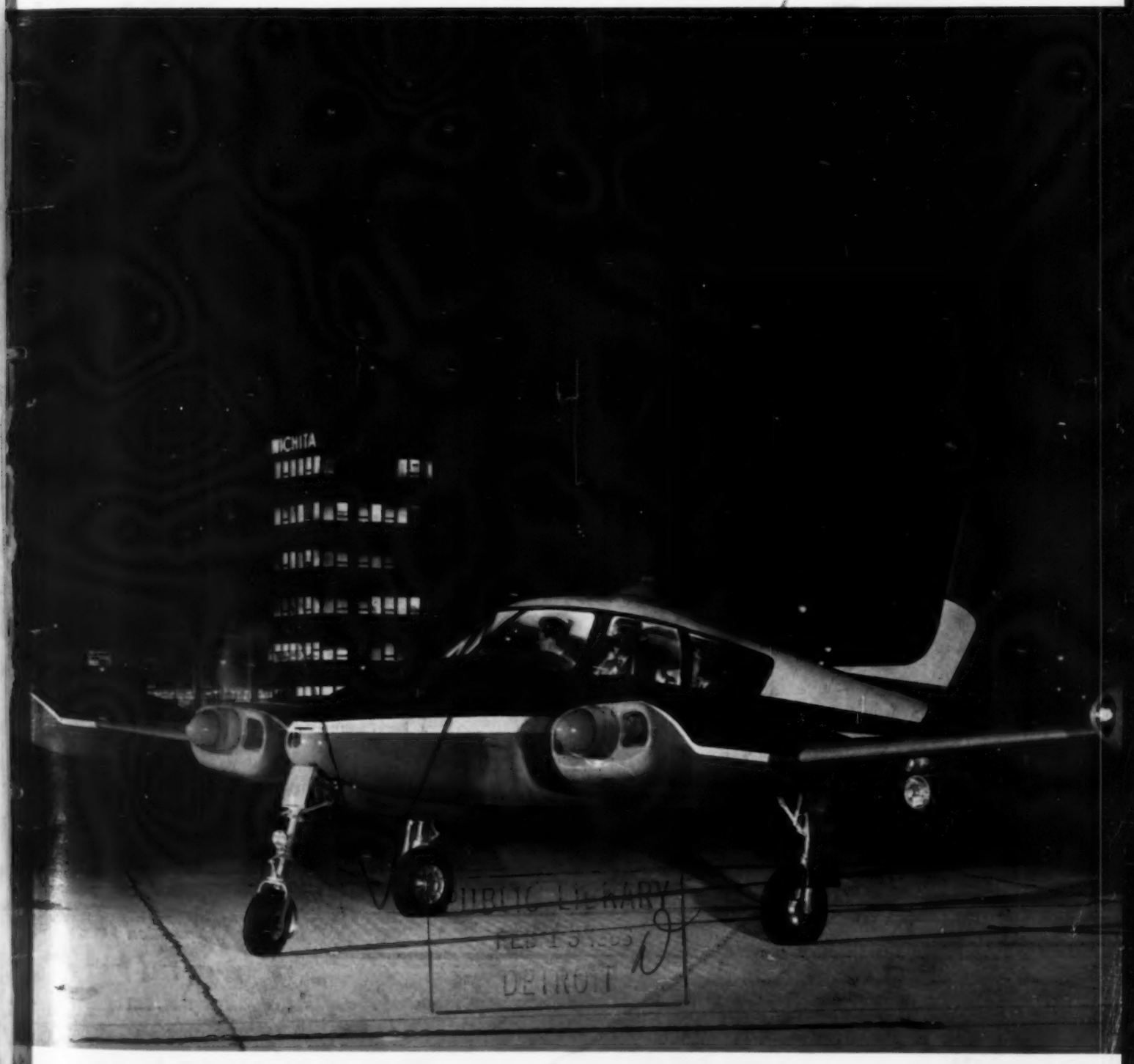

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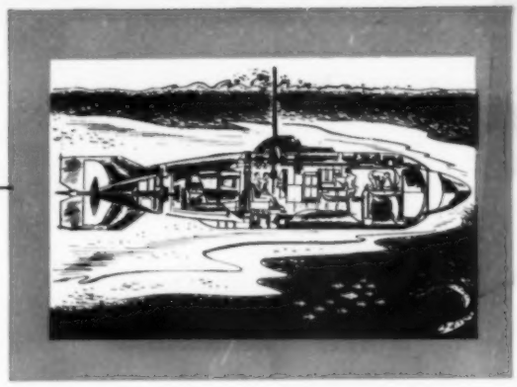
CESSNA MODEL 310

See page 28

PRIVATE EYE FOR THE U. S. NAVY

NUMBER 10 OF A SERIES



Incorporated in the X-1 are all personnel living essentials of larger subs. Crews are just as safe, just as comfortable, as those in large subs.

Because of its maneuverability in shallow water, and its agility in finding secure hiding places, the X-1 is a highly versatile addition to our Navy.

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New tactical mobility is brought to many U.S. Navy operations by the Fairchild X-1, a revolutionary underwater weapons system for close-in reconnaissance of harbors and inlets. The X-1 is the first of its kind ever produced in America, and the first naval vessel of any kind to be designed and constructed by a U.S. aircraft manufacturer.

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Once again, Fairchild design and engineering ingenuity has produced a vital new instrument of defense for our armed forces.

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Feet on the floor, a light touch on the wheel—that's cross-country for you with the great new 1956 Tri-Pacer 150. Simplified controls do the trick—interconnected rudder and ailerons eliminate need for coordinating wheel and rudder pedals. What a great work saver this is in rough air! How relaxed you feel even at the end of a 1000-mile trip!

On the landing you can relax, too, because the Tri-Pacer's tricycle gear just about makes the landing for you. Flare out slightly—no need to balloon getting down to stalling speed. The two main wheels touch, the rugged nose wheel "glues" onto the runway. You roll straight and true with hardly any rudder work.

Brother, that's flying as it ought to be *and is* in the 130 mph Tri-Pacer 150—most popular low-cost, 4-place business plane on the market today.

Go to your Piper dealer's and see the new 1956 Tri-Pacer 150 with its more spacious cabin, individually adjustable front seats and gleaming two-tone paint scheme. Or write for full-color brochure to Dept. 2-F Piper Aircraft Corp., Lock Haven, Penna.

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Learn to fly while making business or pleasure trips. Just rent a Tri-Pacer from your Piper dealer at economical rates and he'll teach you to fly en route. Write for "Learn-As-You-Travel" brochure

Phillips 66
PRESENTS

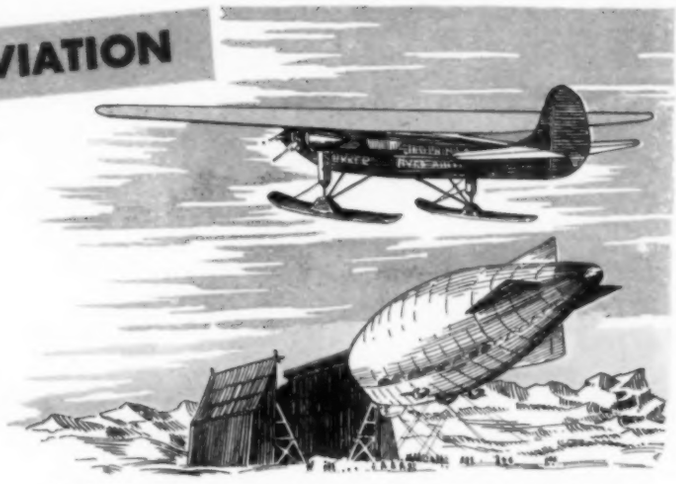
MILESTONES IN AVIATION

Arctic Outpost

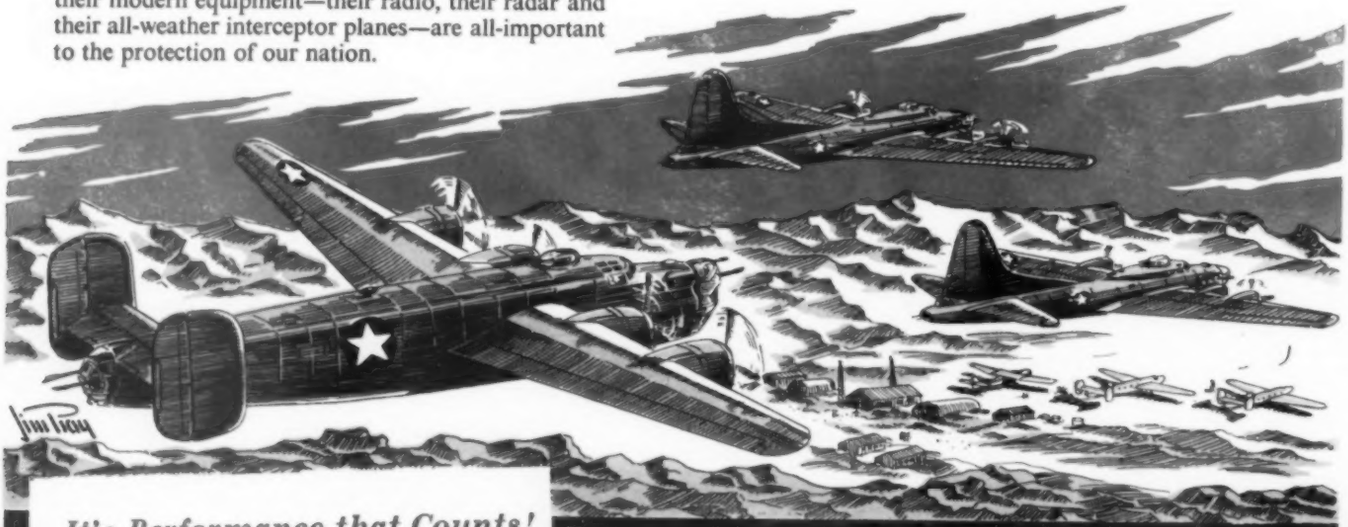
In 1941, the U. S. Army and Air Force decided to establish weather and radio stations, and airfields, on Greenland—to protect the exposed northeast section of the American continent. Lying directly on the air route to the British Isles and Western Europe, the huge ice-capped island of Greenland was an ideally strategic location for repair and refueling stations.

After Pearl Harbor, when clouds of American warplanes began to streak across the icecap, Army and Air Force foresight began to pay off. Airfields, repair and refueling stations, weather and radio stations were all in readiness for the vast air traffic which was to play such a vital part in winning the war.

Today these World War II Arctic Outposts, with their modern equipment—their radio, their radar and their all-weather interceptor planes—are all-important to the protection of our nation.



In 1926, Admiral Byrd (then Lieutenant Commander) and Roald Amundsen were rivals in the race to be first to fly over the North Pole. Byrd made his flight on May 9, 1926, in the tri-motor Fokker *Josephine Ford*. Amundsen followed two days later in the semi-rigid airship *Norge*.

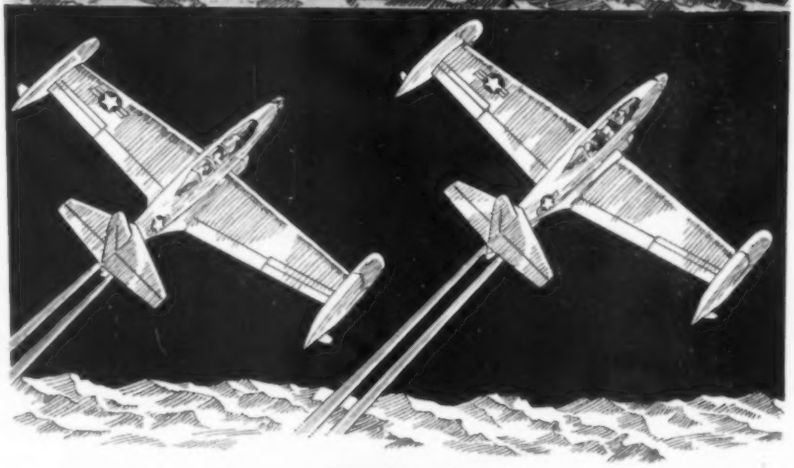


It's Performance that Counts!

In the field of petroleum research for the development of more powerful, more efficient aviation fuels, Phillips Petroleum Company has long been noted for outstanding performance.

For example, Phillips was first to manufacture Di-isopropyl and HF Alkylate, two aviation fuel components of vital importance to modern high-speed, high-power performance.

Phillips produces tremendous quantities of 115/145 grade aviation gasoline for military and commercial use. And today Phillips also is making improved fuels for the latest designs in turbo-props and jets.



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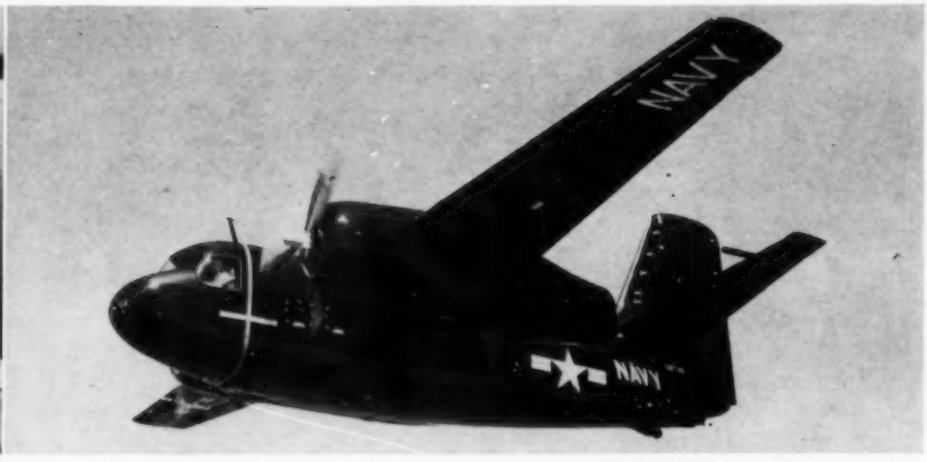
AVIATION PRODUCTS



NEW TRANSPORT VERSION OF GRUMMAN S2F has 9 passenger seats in cabin which is deeper, wider and roomier than fuselage on the S2F submarine killer. In production as the TF-1, new version is passenger-cargo-trainer-utility aircraft for Navy and is land and carrier based. With two 1,425-hp. engines and tricycle gear, it has exceptional performance and single-engine characteristics. Grumman now has in production the S2F-1, S2F-2 and TF-1 versions of this design, the transonic F9F-8 and supersonic F11F-1 Tiger fighters and the SA-16A Albatross air-sea rescue amphibian at Bethpage, L. I., New York.

AIR Report
Significant Trends and News

TEMCO AIRCRAFT HAS SEVERAL NEW AIRCRAFT DESIGN PROJECTS of its own, including a small, 2-place high-performance jet trainer for students without previous flight experience.

THREE BUSINESS PLANE MANUFACTURERS, Piper, Cessna and Beech, delivered 4,269 new commercial airplanes during calendar 1955 — 1,000 more than all lightplane manufacturers combined in 1954. Piper's 1,870 deliveries included 974 Tri-Pacers, 605 2-pl. Cubs and 291 twin-engine Apaches. Cessna's 1,745 deliveries included 880 Model 180's, 448 Model 170's, 228 twin-engine Model 310's, 173 Model 172's and 16 Model 195's. Beech delivered 437 Bonanzas, 131 Twin-Bonanzas, 1 D18 twin and 85 E18 Twins for a total of 654. Aero Design delivered 72 twin-engine Commanders. In terms of retail value, these deliveries represented $75.6 million in sales, divided as follows: Beech $31.4 million, Cessna $31.2 million, Piper $22.5 million and Aero Design $5.4 million. Deliveries for 1956 are expected to approach the $100,000,000 mark in retail sales.

LOW AND MEDIUM POWER JET ENGINES are to be developed by a new Turbomotor Division of Curtiss-Wright Corp., which has acquired Turbomotor Associates of Hempstead, L. I. Emphasis will be on small aircraft jet engines of light weight and high performance.

500 SMALL GAS TURBINE ENGINES have now been produced by Boeing Airplane Co. at Seattle. All have been versions of the Model 502 series, the latest version of which weighs 320 lbs. complete and produces 270 hp. maximum and 240 hp. continuously. Its specific fuel consumption is 1 lb. per hp. hr. These are split-shaft engines each with a single-stage centrifugal compressor, two straight-through combustion chambers, and two single-stage axial turbines. The first Model 502 weighed 240 lbs. complete, produced 175 hp., and had a specific fuel consumption of 1.3 lbs. per hp. hr. Boeing 502's have

FLIGHT MAGAZINE

FEBRUARY, 1956 VOL. 45, No. 2

COVER: With its excellent twin-engine dependability, the new 200-mph. Cessna 310 is seen coming and going at many night-lighted airports. The night photo on our cover shows the Cessna 310 taxiing out from the ramp of the new Municipal Airport in Wichita, Kansas.

—(Cessna Photo.)

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas—Telephone TEnison 6191.

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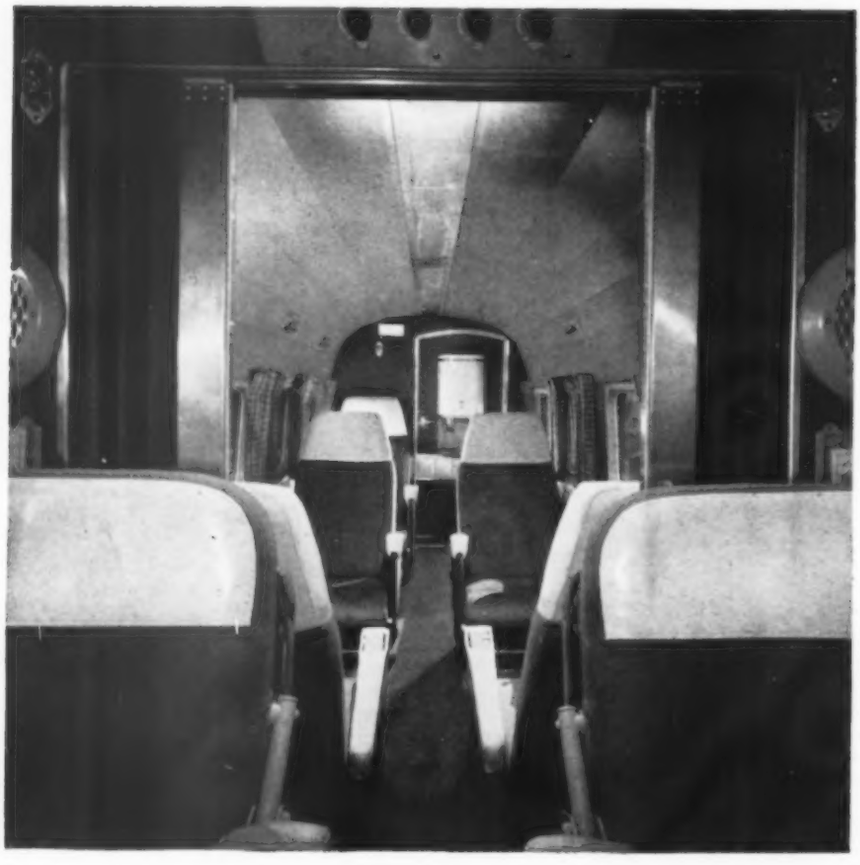
Long, big, distinctive, modern in design and powerful in appearance — has a cruising speed of 215 mph., top speed of 234 mph., range of 1460 miles — carries eight people in extra walk-around cabin roominess.



Luxurious comfort . . . relaxing quiet dominate the spacious interior of the new Super 18 Beechcraft cabin. Quiet, restful, gracious, tailored-to-taste decor assures real travel enjoyment, plus opportunity for consultation and deliberation while on the way to important business missions. A Super 18 represents "psychic income" for busy executives. This executive airplane actually reduces travel time as much as 75 per cent, and provides freedom from the harried rush of meeting travel schedules determined by others.

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powered lightplanes, trucks, boats and other installations but are regularly used to drive generators on Navy minesweepers and other craft and to power Air Force pneumatic air starters for large jet engines.

CIVILIAN JET RACE PLANE DESIGN AND COMPETITION, with first races in 1957, have been discussed by the Professional Race Pilots Association. First new racers will probably be in the 1,000-lb.-thrust class, with speeds held to 350 mph. or so the first year. Due to high costs of jet engines, race builders would prefer leasing them from manufacturers or obtaining them at low prices for further development and proving. A sponsor is needed covering at least three years of competition with suitable cash purses to warrant design and development expense. Steve Wittman, Oshkosh, Wisc., has been re-elected association president. Others serving another term are William Falck, Warwick, N. Y., vice president, and Gordon Stopplebein, Rochester, N. Y., secretary-treasurer. Directors are Arlene Davis, Cook Cleland, William Falck, Luther Johnson, J. E. Smith, Garland Pack, James Vedder, Donald Tygert and Tom Cassutt.

FIRST ATOMIC REACTOR IN AN AIRPLANE has been flying in Texas, with Convair at Ft. Worth carrying it in a B-36 as part of a program to develop an atomic-powered aircraft. The flights are investigating problems of shielding against radiation, radiation effects in aircraft, materials and systems and airborne nuclear instrumentation. No hazards to the public are created by the reactor flights, Convair said.

A NEW TYPE OF LIGHTPLANE AUTOPILOT, under development for three years, will be marketed by Aircraft Products Co., Bridgeport, Conn., which has acquired the firm which developed it, Tactair, Inc. William Harcum, formerly with Sperry, is in charge of the development.

INCREASED PRODUCTION OF LEARSTARS has been effected, according to Manager J. Nelson Kelly, who said 5 Learstar orders totalling $1,900,000 had been received in the last 60 days. Four million dollars in Learstar deliveries had already been chalked up. Kelly said Learstars now have accumulated over a million miles of operation and are adding to this at a rate of 200,000 miles a month.

STANDARD LIFE INSURANCE RATES FOR PILOTS have been announced by two more large companies, N. Y. Life said private pilots eligible for standard life insurance are those 27 years of age or older who operate privately-owned aircraft and have 400 hrs. or more experience and whose recent and future annual flying time is 100 hrs. or less. Standard rates also apply to airline crew members. Occidental Life said standard rates

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You can count on it—new Gulf Aircraft Engine Oil gives you better service, 5 ways:

1. **Improves internal cleanliness of aircraft engines.**
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Gives maximum operating efficiency and increased economy through cleaner engines and less frequent overhauls!

Actual flight tests in aircraft engines used by private operators, executive fleets and airlines, have definitely proved all this.

In addition, this top quality aircraft engine oil gives you remarkable freedom from piston ring and valve sticking, and will reduce rockerbox coking.

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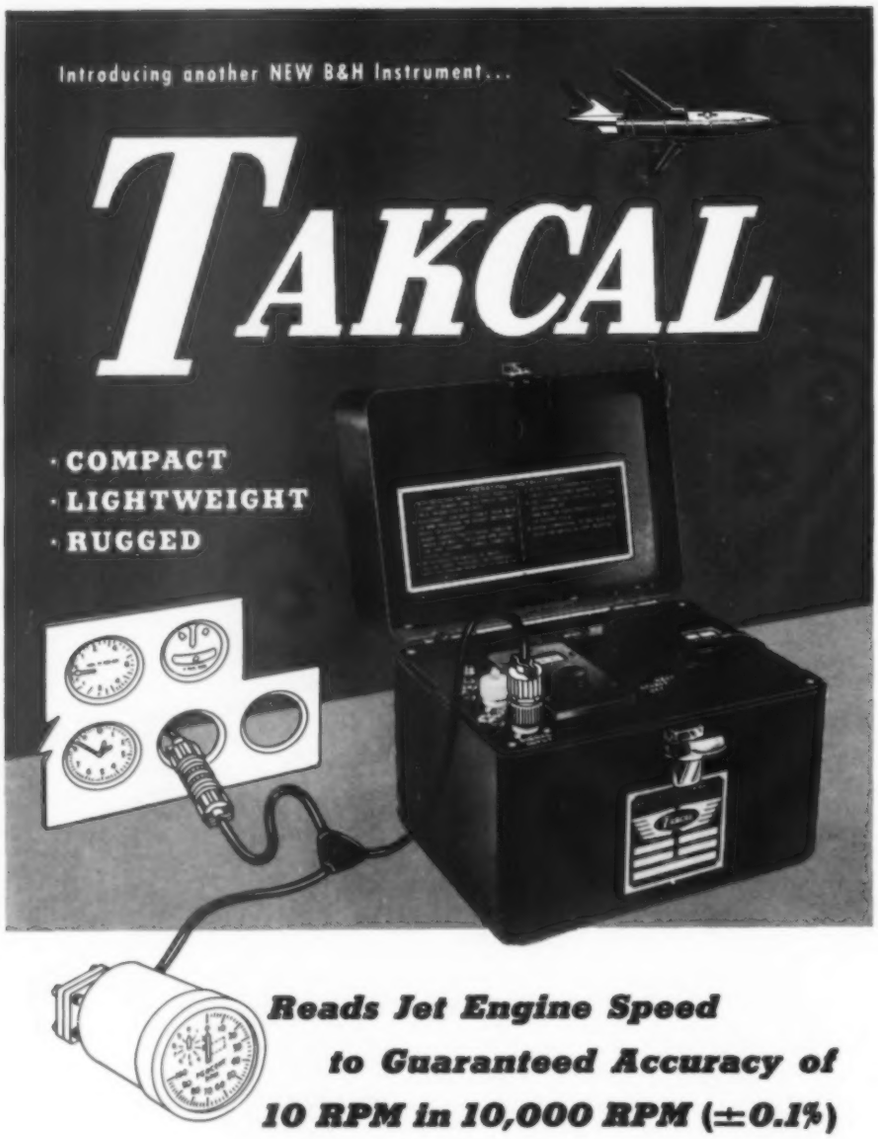
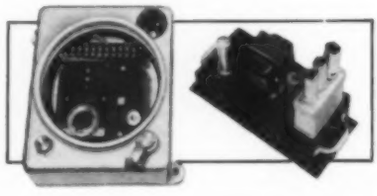


Reads Jet Engine Speed to Guaranteed Accuracy of 10 RPM in 10,000 RPM (±0.1%)

The new B&H TACKAL incorporates a refinement of the frequency meter principle. It operates in the low (0 to 1000 cps) range, reading the frequency of the tachometer generator on a scale calibrated in percent RPM corresponding to the engine's RPM. In addition the TAKCAL checks the tach system. The TAKCAL circuit and tachometer are parallel so that readings can be made simultaneously to determine the accuracy (or inaccuracy) of the aircraft's tach system. The TAKCAL operates during the engine run to properly set up engine controls for maximum economy and safety.

Originally developed as a component part of the J-Model JETCAL ANALYZER, the TAKCAL is now available as a separate unit for use with all earlier models of the JETCAL TESTER.

The TAKCAL operates accurately in all ambient temperatures from —40°F. to 140°F. Low in cost for an instrument of such extreme accuracy, it is adaptable to application in many other fields.



Explosion-proof TAKCAL for special applications. Measures 200 to 7500 RPM, direct reading, with ±0.1% accuracy.

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apply to airline crew members and non-commercial pilots 27 or older with minimum of 400 hrs. solo time and who fly no more than 110 hrs. annually.

CREATION OF A MASTER PLAN FOR U. S. AVIATION FACILITIES DEVELOPMENT has been urged by a White House special study group in its report to the Director of the Budget. The group, headed by Investment Banker W. B. Harding of New York, urged that the plan be formulated under direction of an individual of national reputation, backed by presidential authority. The report criticized existing national aviation facilities as being piecemeal and lagging behind current needs.

THE 23rd NATIONAL SOARING CONTEST will be conducted near Dallas at Grand Prairie Airport July 31-Aug. 9 with Texas Soaring Association host for the events.

SIX TRANSPORT SALES were made by L. B. Smith Co., of Miami to usher in the new year. Herrol Bellomy said the sales were an executive DC-3 to Minnesota Mining and Manufacturing Co., a 28-passenger DC-3 airliner to Air France, a 46-passenger C-46 airliner to Aerovias Q, two cargo C-46's to World Wide Airways and a cargo C-47 to Bancroft Industries.

EXPANSION OF AERO CORPORATION OF ATLANTA for increased business-plane, airline and military overhaul, maintenance and conversion services was begun last month when the 15-year-old firm was purchased by a group headed by Thomas P. Lombardo, formerly engineering and sales manager of Dallas Aero Service and previously with Temco, Pioneer Air Lines and TACA Airways. With four hangars and complete facilities, the Aero Corp. transaction was closed for the purchasers by O. R. Moore of Atlanta and Robert McCulloch of Dallas, who are interested in the operation as investors only. Aero is a Collins radio dealer and is staffed by over 100 technicians handling aircraft modification, overhaul, conversion, maintenance, propeller overhaul, hydraulic service, radio, accessories and instrument service with large stocks of parts and accessories. Lombardo heads the new operation as president and general manager. John H. Greene, Jr., is secretary-treasurer.

CERTIFICATION OF THE DOMAN LZ-5 eight-place commercial helicopter was completed last month at Doman Helicopters, Inc., Danbury, Conn. The LZ-5 is powered by an 8-cylinder, supercharged, 400-hp. Lycoming engine, has a 1,950-lb. useful load at a 5,200-lb. gross weight, and features an unobstructed cabin with 7-ft. doors. Production is to be started for commercial sales.

(Continued on page 36)

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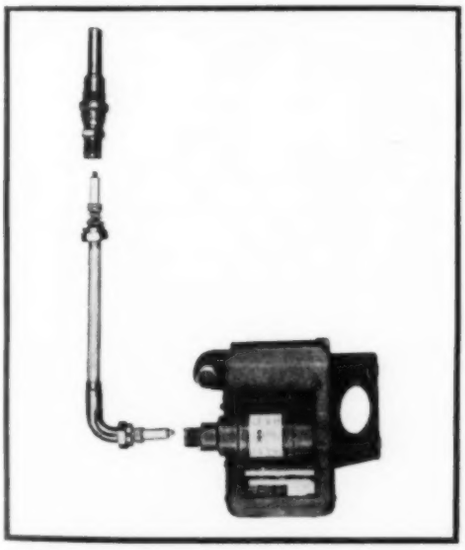
FIRST in JET ENGINE IGNITION



Only Bendix provides the complete ignition system for jet engines—Ignition Unit, Igniter Plug Leads, Igniter Plugs and Control Harness.

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That's why from blueprint stage to field service follow-through you can depend on Bendix—the most trusted name in ignition—for the best in jet ignition for today's planes or tomorrow's plans.

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A letter from Daddy

TO: LINDA HENRICH

Dear Linda-bird:

It's a fine winter day at Dallas — snow up to my antenna-loop and dogs mushing about Southwest Airmotive's flight line toting rum-kegs on their necks, seeking lost aviators. Thank goodness tomorrow's forecast is 99 degrees and dust!

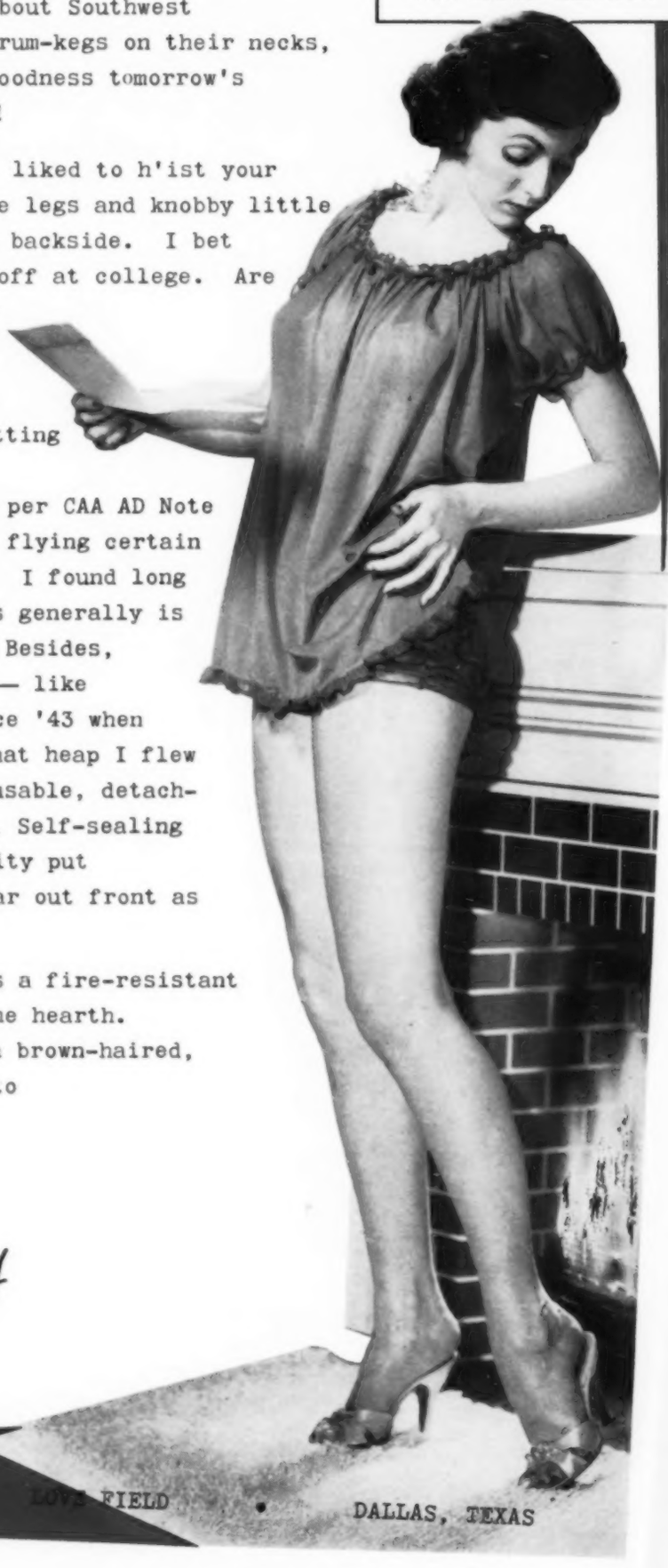
I'm dreamin' how you, as a kid, liked to h'ist your nighty and plant your fat little legs and knobby little knees by the fire, warming your backside. I bet you haven't changed a bit 'way off at college. Are your ankles still bigger'n your calves? Ho-ho-ho.

Memory fires are nice, but some others aren't. Today, SAC's putting fire resistant Aeroquip prop feathering lines in my Lodestar per CAA AD Note 55-15-3, mandatory for airlines flying certain Douglas and Lockheed airplanes. I found long ago what's good for airline boys generally is good for business pilots, too. Besides, I've been an Aeroquip hose man — like you're a nylon hose girl — since '43 when the Air Force installed it in that heap I flew droppin' eggs on Adolf. Its reusable, detachable fittings; quick-disconnect, Self-sealing Couplings, and overall reliability put Aeroquip's original design as far out front as Jane Russell's T-shirt.

And sweety, until Aeroquip makes a fire-resistant bustle, stop warmin' yours by the hearth. Besides, it ain't ladylike for a brown-haired, hazel-eyed kid who's blossomed to 112 lbs., 5'6", and 18!!

Love,

Daddy



SOUTHWEST AIRMOTIVE CO. • LOVE FIELD • DALLAS, TEXAS

Just among ourselves

Shades of Gene Vidal

IN one of his first public utterances since assuming the Administrator of Civil Aeronautics job, Charles J. Lowen opened up an old sore spot with people in the lightplane business when he told the Women's National Aeronautical Association in Tulsa last month: "We still need a plane for the people; a plane which a great segment of the people can afford to buy and fly. You and I have been hoping for such a plane for these many years, but neither industry nor government has produced it."

"Such a plane," he added, "safe and not too costly, would be bought and used by the women of this country. It must be a safe plane — the women will insist on that, and we in the CAA will do our important part in making it safe. It would be a good, dependable 'family' plane, comparable to the automobiles we now buy by the millions."

These are most astounding statements from a man who boasts a broad aviation experience since his graduation from college in 1938. Apparently there are some fundamental soft spots in his aviation background and thinking, else he would not utter such nonsense. It's the same old philosophy of the "$700 airplane" trumpeted and attempted by Gene Vidal way back in 1934-1935 and later picked up by the Sunday supplement writers in 1945-1946. We thought the issue of the government seeking to develop a low-cost airplane for the masses was dead and buried. But Mr. Lowen revives the old carcass and says he will "work as a government servant to bring this about."

In all seriousness and without being flip or arrogant we suggest that Administrator Lowen go forth and fly the Piper Tri-Pacer, the Cessna 172 and 170, the Mooney M-20 and other airplanes now enjoying a healthy sale to people who fly for business and personal pleasure. These airplanes were developed in spite of the government with all its regulations. They are simple, easy to fly and in the hands of people with ordinary judgment and weather sense, are much "safer" than an automobile travelling today's congested highways.

As for his desire to produce a low-cost craft for the masses, we further suggest he sit down and tabulate a bill of development, certification and materials on any one of the lightplane models on the market today. Then he should figure up the production and marketing costs and tell us how he could substantially reduce the cost of any one model. With these easy-to-get figures at his disposal we're convinced he'll cease making such ridiculous statements as those before the WNAA at Tulsa. This airplane he wants, "comparable to the automobiles we now buy by the millions" is, we fear, the figment of wishful thinking. Little wonder neither the industry nor the government has produced such a dream-plane with no more specifications than "safe and not too costly."

The government servants could serve aviation more intelligently by providing more services, not less, so that the excellent airplanes we have today will come up with more utility. No government agency could provide the engineering brains and dollars now pouring into the safe, efficient and easy-to-fly lightplanes currently coming out of our commercial factories. And while we're on the subject, if American business, industry and agriculture find the modern lightplane safe, economical and highly useful (many with women at the controls) why doesn't the CAA buy some of these efficient machines and take their agents off the highways? If the CAA would just purchase and use modern airplanes in the dispatch of their official duties, perhaps they would find that the golden era of private air transportation is already here in spite of all their activities and pronouncements in past years to discourage it.

A Sound Proposal on Aviation Facilities

WE hope that some positive action stems from a report just handed the Director of the Budget Bureau by a special study group on the subject of aviation facilities.

The group, headed by William Barclay Harding, New York investment banker and aviation authority, was asked last May to provide answers to the following questions:

1. Should a study of long-range needs for aviation facilities and aids be undertaken?
2. What should be the coverage of such a study, if it should be made, including an indication of the specific areas and subjects which seem to require particular attention?
3. How can such a study, if made, best be organized and conducted?

The Harding investigators gave an emphatic "yes" to the first question, advising that a comprehensive study be made leading to a national plan for the aviation facilities of the United States for the next twenty years.

To the second question the group called for the following areas of study:

1. How to make more efficient use of the national airspace by allocation and traffic control which is safe, efficient, and equitable for all users.
2. How to integrate civil and military expenditures, particularly expenditures for aviation facilities research and development.
3. How the cost of facilities should be financed from private and public sources.
4. What kind of government organization is required to control use of the airspace and be responsible for the appropriate Federal interest in the construction and use of government-financed military and civil aviation facilities.

As to the third question, the special group concluded that the study should be made under the direction of an individual of national reputation, with a broad understanding of civil and military aviation. He would be backed

leading a dog's life?

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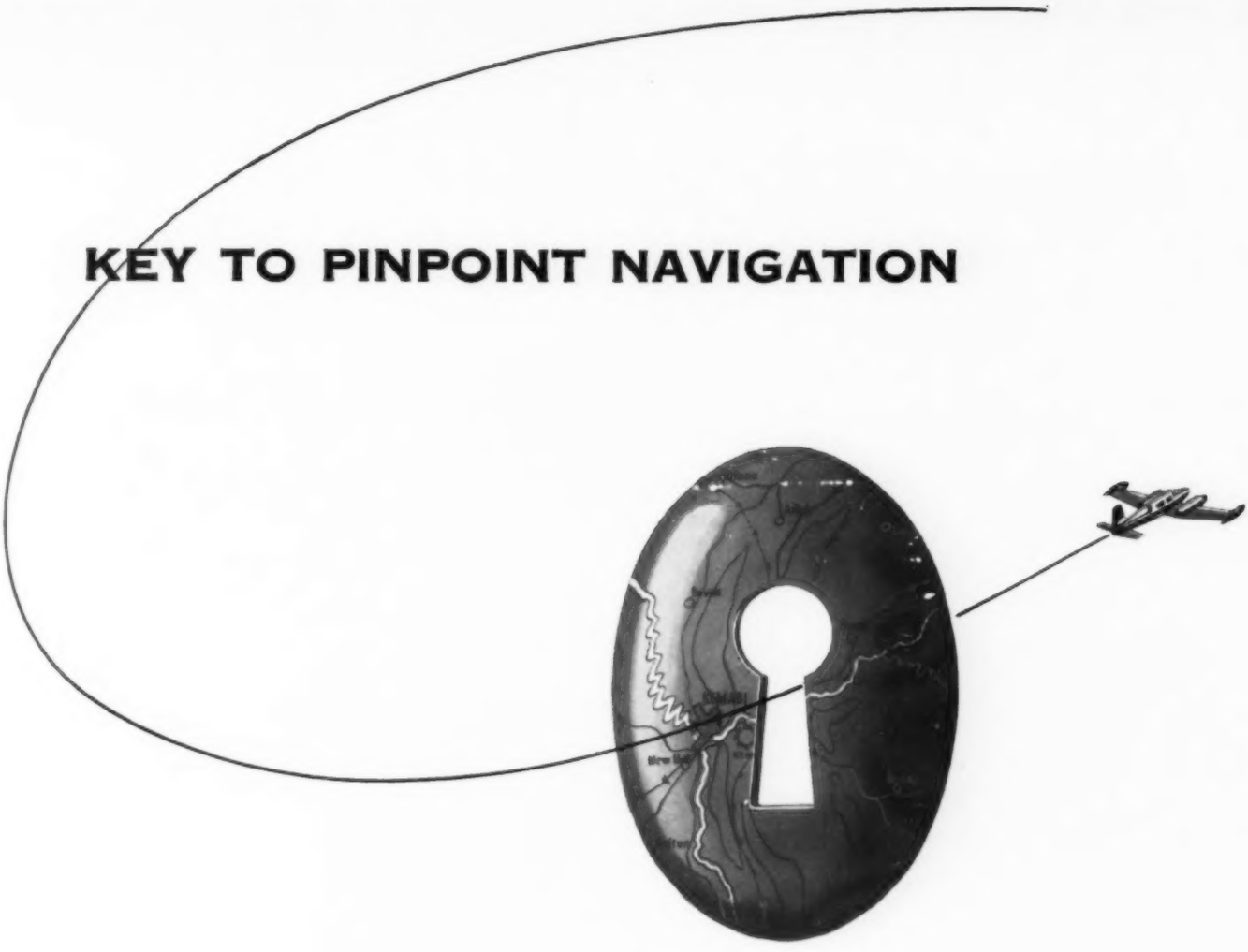
by Presidential authority and his position established independently of any existing operating departments and interdepartmental committees with complete freedom from deep involvement in day-to-day operating problems. It is contended, as every airman must agree, that unless some urgent action of this nature is taken even more dangerous conditions in the air can be anticipated.

The Harding aviation facilities report contains brief expositions of problems now apparent in the realm of future aircraft performance, productivity and operating costs; operating problems; air navigation and traffic control; airports and government organizations involved. In the chapter on air navigation and traffic control, the point is brought out that the system being developed by the Civil Aeronautics Administration and the system being developed by the military (the SAGE system — Semi-Automatic Ground Environment) have different objectives even though both are basically designed to locate, identify and track aircraft.

Very little has been published on the Lincoln-SAGE project. It is said to be costing somewhere in the neighborhood of $3 billion. Designed after studies in 1948-1949, SAGE will start operating on a limited basis shortly. It provides for the automatic transmission of information from a large number of radar scopes to a central electronic computer, where the data are processed to display pictorially all the aircraft operating over an extensive region. It is supposed to be able to detect, identify, and track all aircraft over the U. S. and approaches. It is also said to be capable of controlling traffic pictorially and with computers while achieving its primary purpose of continental defense. The Harding advisory group recommends that SAGE should be adapted immediately to our high density traffic areas and that the military system must be coordinated with the $260 million program under development by CAA. This is just one of the many areas of confusion that must be cleared by the proposed comprehensive aviation facilities study recommended by the Harding group.

We concur with the report to the Bureau of the Budget. Since the Air Force alone is spending $1.5 billion a year on airports and with the SAGE system costing some $3 billion, there's apparently plenty of money to work with. If, through wise planning and proper coordination, neither of which we have now, we can perfect an air traffic control system that permits *everyone* to fly while still providing the defense requirements, let's get on with the job. If this can be accom-

KEY TO PINPOINT NAVIGATION



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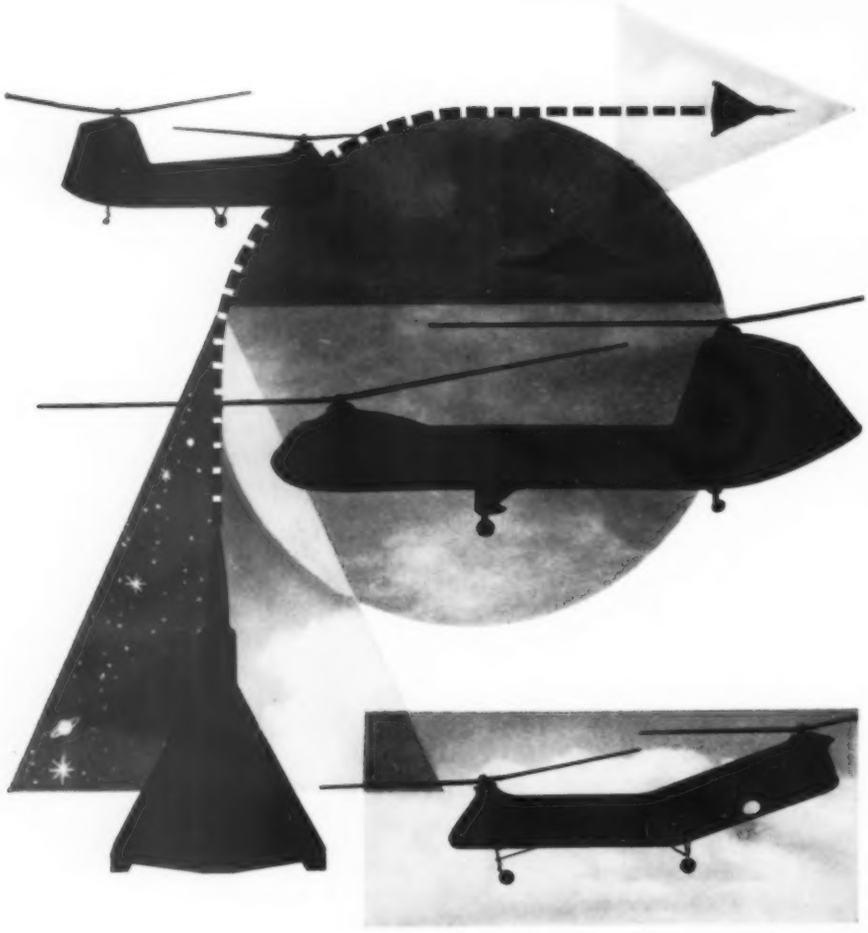

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plished without military control of civil aviation activities, the Harding advisory group will not have studied in vain.

Gone West

AVIATION lost two of its most notable pioneers in recent weeks with the deaths of Ralph Damon and Glenn L. Martin.

Glenn Martin followed the Wright Brothers by only a few years in accomplishing successful powered flight after much experience with box kites and gliders, his first powered flight taking place in Santa Ana, California, in 1909. After a financially successful barnstorming career in the West he settled down to designing remarkable land and seaplanes which led to the formation of a company with the Wrights at Cleveland. Following World War I production his financial backers withdrew and he went out on his own to develop the Martin plant near Baltimore. Some of our greatest airplane designers and businessmen served their apprenticeship under Martin. He will always be remembered and hold high rank in aviation's immortal Hall of Fame.

Ralph Damon, like Martin, was an accomplished airplane man before becoming an aircraft manufacturing executive and later, an airline president. We remember with considerable warmth our first encounter with him when he was living in the mock-up of the old Curtiss Condor sleeper plane in the middle 1930's at St. Louis where Damon, always a practical man, and his wife were trying to determine how large the berths and the wash room should be for adequate passenger comfort. We presume he was the first man ever to shave in an airplane mock-up! We mention this incident because it was so typical of Damon's happy mixture of foresight with trial-and-error experimentation, a characteristic of Glenn Martin's and of all the old pioneers whose works are the foundation stones of all aeronautical progress.

With the passing of men like Damon and Martin we are reminded that aviation's pioneers brought the airplane to its greatest usefulness and fullest fruition right here in the United States. The airplane has not fared so well under nationalization, socialization or the planned economies and political dictatorships. At least until this point in human history no nation, not even the vaunted Russians, have been able to match American inventive genius working for a profit in a free economy. Martin and Damon epitomize that genius and the brand of freedom now being attacked throughout the world.

★ ★ ★

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Aeroproducts Propellers

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The Lockheed Electra airliners, setting the pace for the era of jet-powered transports and now in production for American Airlines, will be equipped with the proved team of Aeroproducts Propellers and Allison turbine engines. Both are products of General Motors.

Just as the Allison Turbo-Prop engines were selected because they are the most advanced in the world today, American chose Aeroproducts Propellers after the most careful evaluation. The decision in favor of Aeroproducts was based on rugged blade construction combined with unique features of pitch control and dependability. Result of more than ten years' intensive development, the Aeroproducts turbine propeller made its first flight in December 1945, in the first Turbo-Prop airplane to fly in the United States.

Since then, this General Motors power package of Allison engines and Aeroproducts Propellers has accumulated thousands of hours of successful flight experience in the Allison Turbo-Liner, the Air Force C-131C Transport and the Navy R3Y "Tradewind."

Now the advantages of Turbo-Prop power, demonstrated in this military experience, will be applied to commercial travel by air. The new four-engine Electras will cruise comfortably at more than 400 miles an hour —bringing speed and smoothness to short and medium-range flights. With the ability to take off and land on existing runways, these new Turbo-Prop transports will operate into any airport now regularly served.

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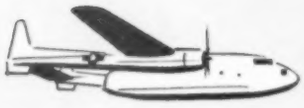

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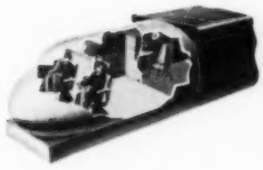

Electronic Simulators, built by Curtiss-Wright, save millions of dollars, thousands of man-hours.

One of the greatest single factors in improving safety, and at the same time saving literally millions of airline and military dollars, is the growing worldwide acceptance and demand for Electronic Flight Simulators developed by Curtiss-Wright. It costs approximately $400 to keep a four-engine aircraft aloft for an hour. But for less than $30 per hour, pilots and crews can "fly" the Electronic Simulator built by Curtiss-Wright—gaining experience identical to actual flight — without ever leaving the ground — releasing multi-million dollar equipment for earning, not learning. U.S. Air Force studies show that at a single training base, over $4,000,000 per year is saved by Simulators.

A Simulator is constructed around the actual crew compartment of the aircraft it represents, complete with all instruments and controls. The physical resemblance stops here . . . but not the realism. The Simulator — a complex arrangement of analog computers that actuate, through servomechanisms, all controls and instruments — faithfully reproduces the flight characteristics, the engine and aircraft sounds of the prototype. For all practical purposes the pilot is flying. The feel of flying is in the response of his controls. His instruments are in action. A "trouble" console can present him with problems he might not encounter in months of actual experience — ice, snow, sleet, malfunction of equipment, turbulence. Varying sounds warn him of trouble. Red lights tell him of danger.

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So effective is flight simulation, and so vital to the economics of crew familiarization, that the Air Force has specified Simulators for every operational aircraft type scheduled for production. Curtiss-Wright now has sixteen military and six commercial Simulator types in production and service. Major world airlines, as well as the military, have ordered and reordered Simulators — the most effective and economical means of developing skilled crews.

Only through electronics is such flight reproduction possible. Only Curtiss-Wright, with basic patent rights in this field, and its licensees, build Simulators, and Duplicators, for both the Armed Services and commercial airlines of the world.

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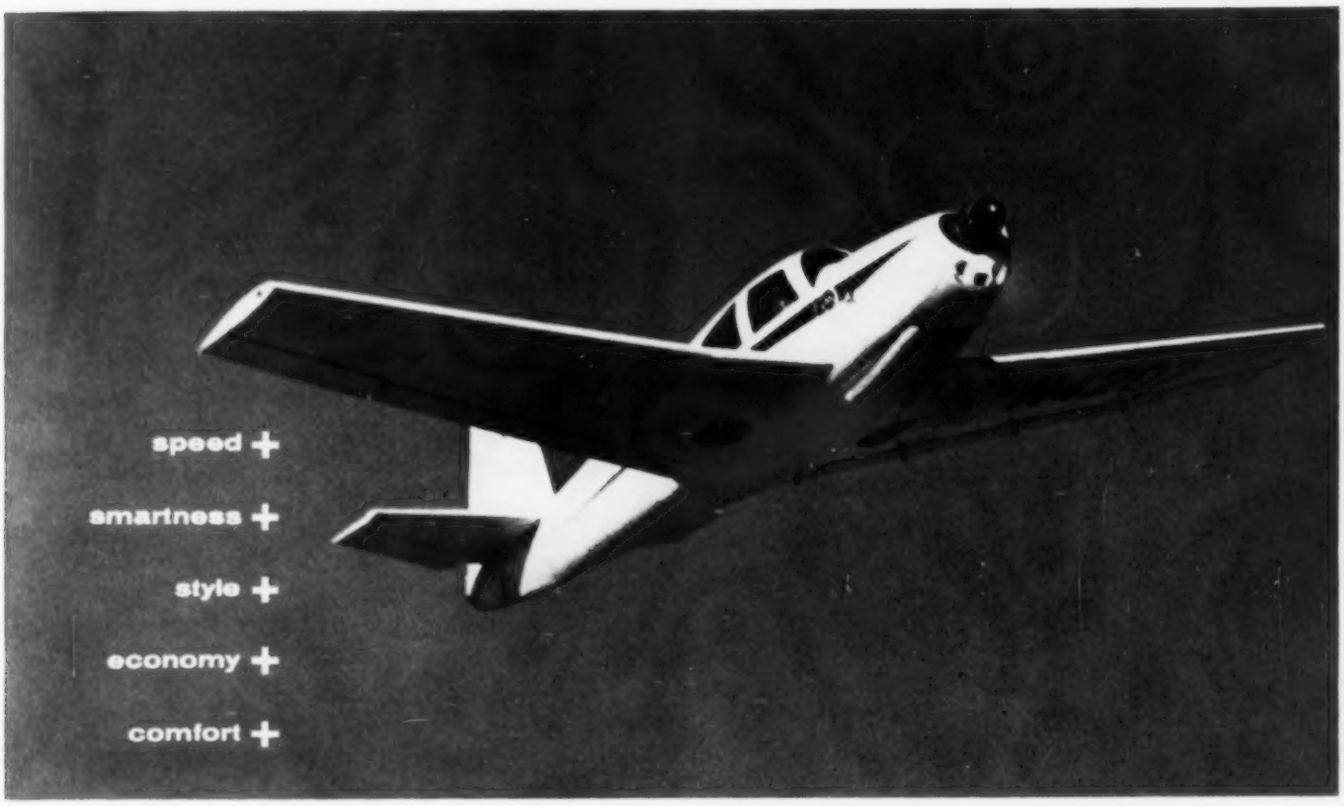

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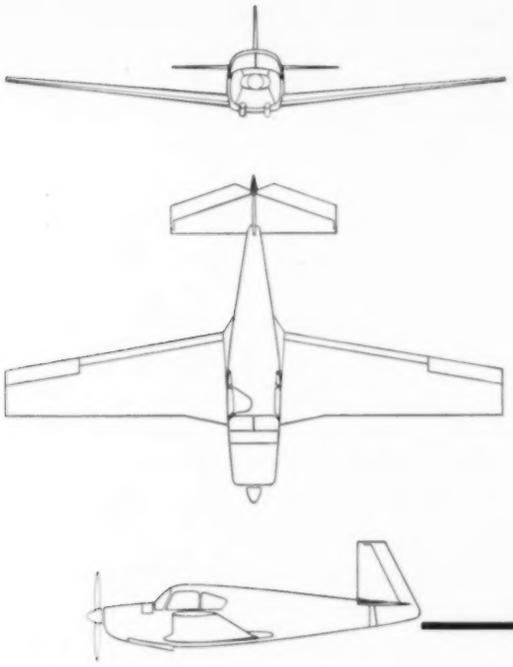

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HERE ARE FACTS WHY

DME IS A SAFE INVESTMENT

There has been so much smoke and confusion about future navigation systems that the airspace is apt to be filled with ideas instead of navigation signals.

The situation has understandably bewildered aircraft owners and given them cause to wait and see—even though they realize that a navigation system which gives them both distance (rho) and bearing (theta) would greatly simplify their cross-country navigation and IFR operations.

These facts are now clear and cannot be disputed:

1. The VOR/DME system is fully developed providing highly dependable and extensive service. Congress has appropriated funds for continuation of this system. There are 231 DME's in operation now and 175 more on site ready to be turned on when additional funds become available.

2. CAA, in its 5 year navigation program proposal just made public, calls for 383 more VOR's and 648 additional DME's.

3. The Air Coordinating Committee, whose recommendations generally set National Air Policy, has assured DME operation for years to come. ANDB's decision earlier this year was not to *adopt* Tacan, merely to investigate its possible use in the Common System.

4. Tacan is still in a very experimental stage as a common system element. In its present form it is strictly a tactical navigation equipment. Conservative estimates say that four years would be required to re-engineer ground equipment for satisfactory civil airway use. No satisfactory design for airline or small aircraft Tacan has been demonstrated. Tacan does not provide voice communication or ILS approaches and these functions would require separate equipment if Tacan were adopted in its present form.

5. Implementation of such a system on the airways to the same level of operation as VOR/DME today would require eight to ten years. This has been confirmed by CAA, ANDB and IATA.

6. There is no argument in any quarter as to the reliability, accuracy, or dependability of present-day DME. It is recognized by all as being equally accurate as any other distance measuring system. It has been completely "de-bugged" and backed by a nation-wide service.

7. New, authorized DME approach procedures are already being published in the Airman's Guide and are being incorporated in the Jeppesen Manual as fast as released. These DME approaches permit lower minimums in many cases where terrain clearance has been a problem, reduce to a minimum let-down procedures, greatly expedite instrument operations. Australia has made DME mandatory for airline operations and pilots report DME far more accurate than older systems of using cross-bearings and even fan markers for position indication.

8. The conclusion which can be drawn by any clear-thinking aircraft user is that:

- **No other system can possibly supersede DME for a decade.**
- **VOR/DME provides *today* and in the years to come a highly superior navigation system with continuous position indication without estimate, calculation or guess-work.**
- **Highly reliable, light-weight airborne DME is available today.**
- **Anyone installing DME in his aircraft can be assured beyond any question of doubt of getting a full span of usefulness out of his DME with no danger of rapid obsolescence.**

if you would like more information on Narco Model UDI-1A DME see your nearest Narco distributor, factory-approved service center or write to National Aeronautical Corp., Ambler, Pa.

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Captain Eddie Rickenbacker chooses

Allison Prop-Jet Power for Eastern Air Lines

☆ Serving more United States cities than any other airline ☆

Eastern's new Lockheed Electras—world's fastest, smoothest, most luxurious airliners—will fly at well over 400 miles an hour!

AFTER years of engineering research covering all types of aircraft power units, Eastern Air Lines has selected Allison Prop-Jet engines and Aeroproduct Propellers for our fleet of 40 new radar-equipped Lockheed Electra airliners.

This decision represents a great step forward in Eastern's progress into the jet age, and reflects our conviction that Allison Prop-Jet power, a product of General Motors, is the most efficient and dependable engine-propeller team for the new Lockheed Electra.

This new Allison engine harnesses the vast power of a modern gas turbine to a propeller. It uses less fuel than a straight jet, yet it enables aircraft to fly faster with greater payload than any other propeller-type aircraft engine in commercial use today.

Allison-powered Electras will be in service on Eastern Air Lines routes in the Fall of 1958. Flying at speeds of well over 400 miles an hour, these 66-passenger airliners will offer unprecedented smoothness of flight, a new standard of quiet, restful comfort, and the highest degree of dependability.

We of Eastern congratulate General Motors on this great achievement in aircraft power, an achievement that will help bring the untold benefits of modern air transportation to more millions of people in the years to come.

Chairman of the Board, EASTERN AIR LINES

I AM happy to announce that Captain Eddie Rickenbacker, one of the most highly respected figures in aviation and dean of the air transportation industry, has chosen Allison Prop-Jet engines and Aeroproduct Propellers for Eastern's new fleet of Lockheed Electra airliners.

Captain Rickenbacker's decision is a magnificent tribute to General Motors and the Allison Prop-Jet engine, the first gas turbine engine to receive Civil Aeronautics Administration approval for commercial service.

The Allison Prop-Jet engine is the most advanced power plant of its type and is backed by more than 7 million hours of turbine engine flight time in military aircraft.

In Allison Prop-Jet power, General Motors again demonstrates its leadership in the development of power for all kinds of transportation. In aviation, in motor vehicles, in locomotives and in marine engines, GM has gained the confidence of millions of people who daily depend upon GM power units.

In air transportation, Eastern Air Lines has earned and held the confidence of the traveling public for over 27 years. General Motors and Allison Division are proud to join Captain Rickenbacker and Eastern Air Lines in this great contribution to the future of commercial aviation, national defense and the progress of American-designed and American-powered aircraft.

President, GENERAL MOTORS CORPORATION

The Allison Prop-Jet engine is backed by more than 7 million hours of turbine engine flight time—experience where it counts most—in the air.

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BUILT IN THE UNITED STATES FOR THE NEW ERA IN AIR TRAVEL

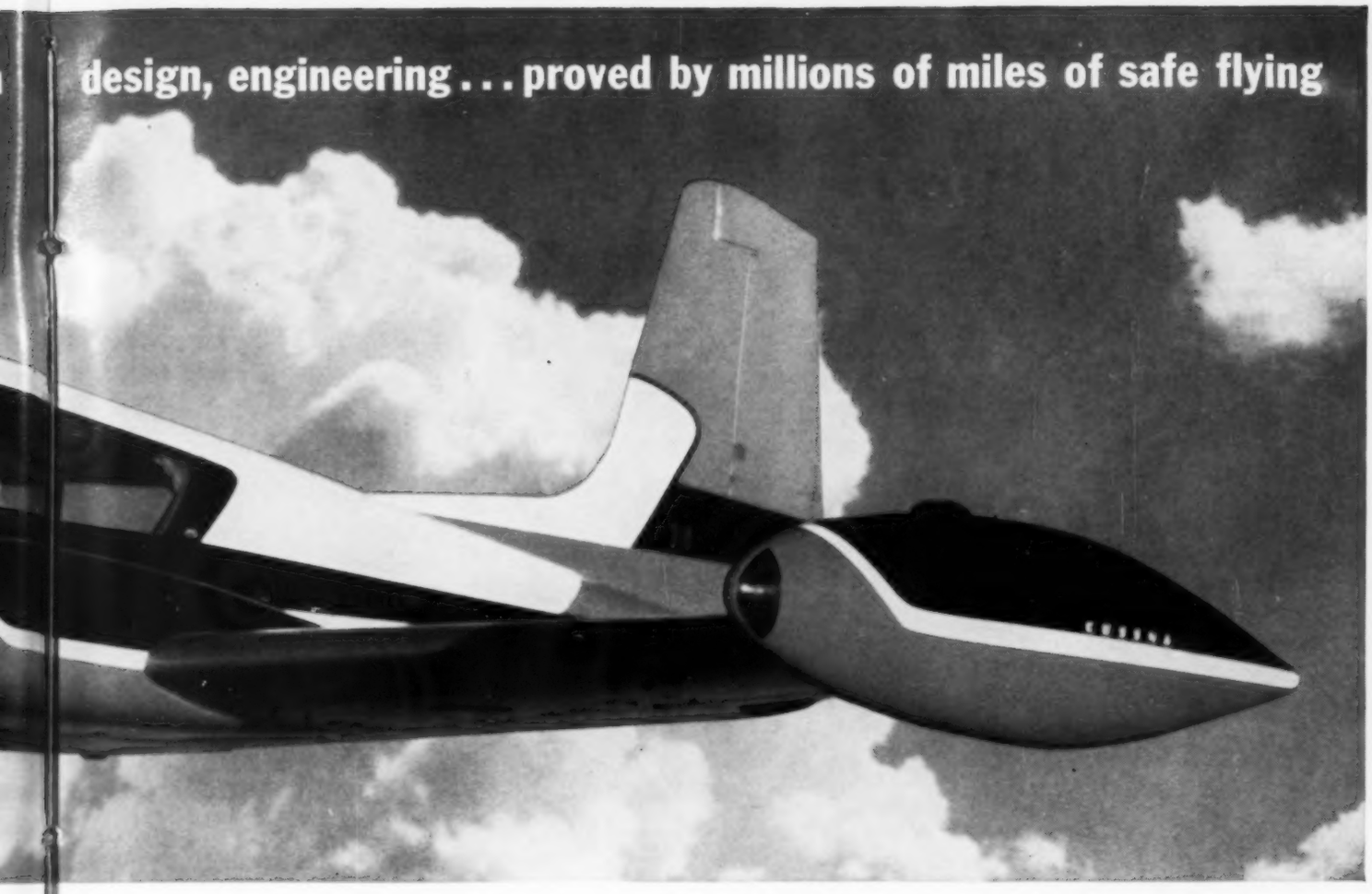
THE FAST, EASY-

ADVANCED DESIGN: Cleaner, **Smarter,** More Efficient... **cuts drag;** makes take-off, flying, landing easy—simple. ADVANCED ENGINEERING: **Improves power-weight ratio, adds new safety factors,** gives new "hush-flight" comfort.

Split flaps reduce landing speed

Jet tail gives low-speed stability

21-inch nacelles cut drag and adds lift



TO-FLY CESSNA 310

Double windows—new engine suspension—give "hush-flight" comfort

It looks fast . . . it is fast! Takes 5 people 1600 miles in a single day with 2 hours at destination. But—even more important—advanced features mean easy short landings and take-offs . . . safe flying! The remarkable safety record of more than 250 Cessna 310's now in regular operation proves that!

It lands in less space than many single-engine airplanes . . . has more power per pound of weight than any other business "twin." You can climb 380 feet per minute—fully loaded—on one engine! Only $54,950 f. o. b. Wichita. Have your Cessna dealer (yellow pages of phone book) demonstrate or write CESSNA AIRCRAFT CO., Dept. FM-4, Wichita, Kansas.

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Safety wing-tip tanks allow more lift with less wing

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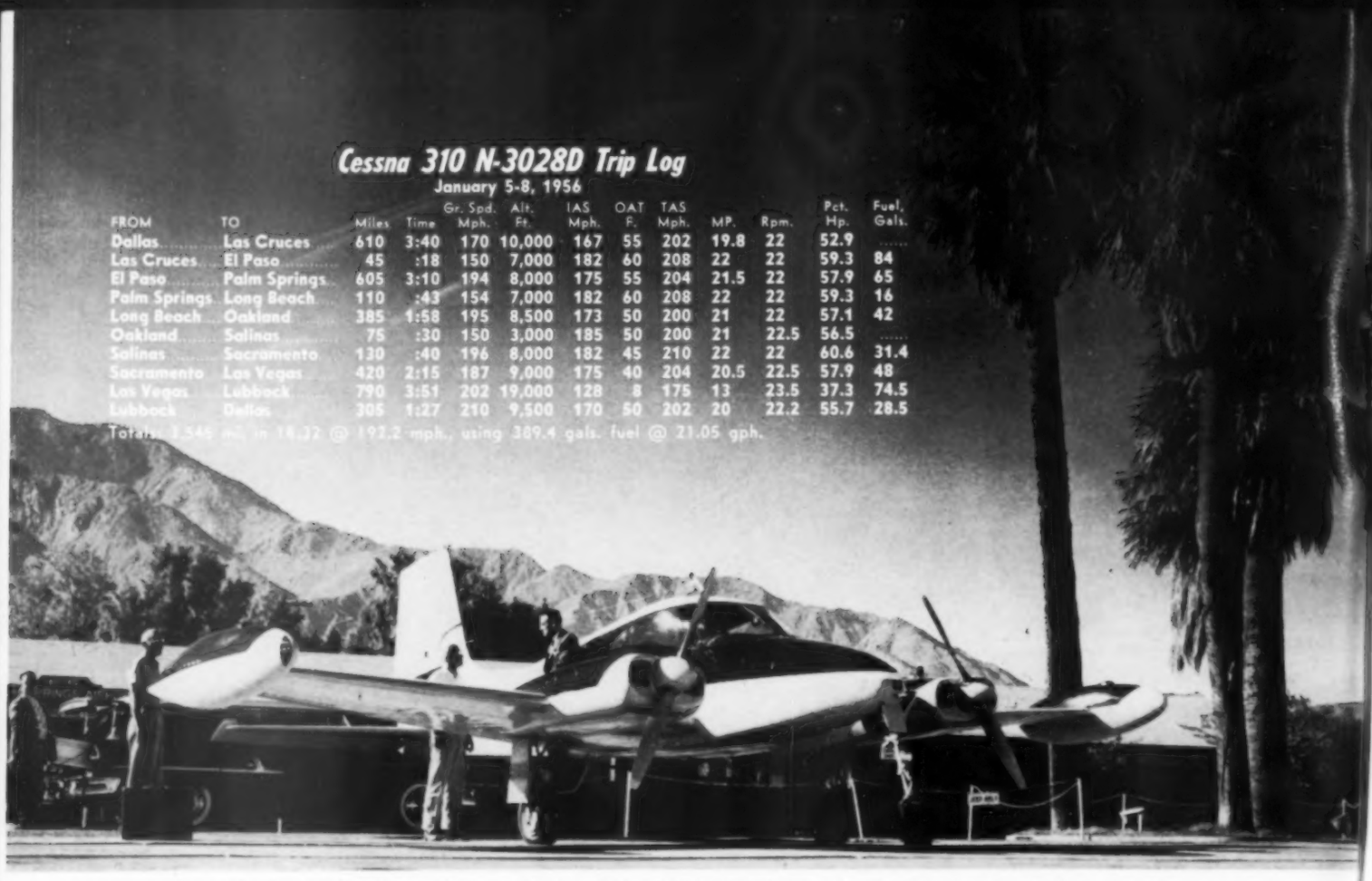
4 GREAT CESSNAS 170 172 180 310

THE COMPLETE AIR FLEET FOR EVERY BUSINESS NEED



Cessna 310 N-3028D Trip Log

January 5-8, 1956

FROM	TO	Miles	Time	Gr. Spd. Mph.	Alt. Ft.	IAS Mph.	OAT F.	TAS Mph.	MP.	Rpm.	Pct. Hp.	Fuel, Gals.
Dallas	Las Cruces	610	3:40	170	10,000	167	55	202	19.8	22	52.9	.....
Las Cruces	El Paso	45	:18	150	7,000	182	60	208	22	22	59.3	84
El Paso	Palm Springs	605	3:10	194	8,000	175	55	204	21.5	22	57.9	65
Palm Springs	Long Beach	110	:43	154	7,000	182	60	208	22	22	59.3	16
Long Beach	Oakland	385	1:58	195	8,500	173	50	200	21	22	57.1	42
Oakland	Salinas	75	:30	150	3,000	185	50	200	21	22.5	56.5	.....
Salinas	Sacramento	130	:40	196	8,000	182	45	210	22	22	60.6	31.4
Sacramento	Las Vegas	420	2:15	187	9,000	175	40	204	20.5	22.5	57.9	48
Las Vegas	Lubbock	790	3:51	202	19,000	128	8	175	13	23.5	37.3	74.5
Lubbock	Dallas	305	1:27	210	9,500	170	50	202	20	22.2	55.7	28.5

Totals 3,545 mi. in 18.32 @ 193.2 mph., using 389.4 gals. fuel @ 21.05 gph.

We stopped at Palm Springs for lunch. Here are Mert and Mac Haskell, brothers, who manage the airport there, helping us pose a picture on the Palm Springs ramp. —(FLIGHT MAGAZINE Photo.)

Performance To Spare

A trip in the Cessna 310 with 200-mph. performance on partial power

By GEORGE E. HADDAWAY and TOM ASHLEY

ONE thing we couldn't question about the Cessna 310 was speed. We were cruising at 52.9 per cent power at 10,000 ft., which is 19.8 inches of manifold pressure and 2,200 rpm., and were indicating 167 mph. With outside air temperature at 55 degrees, this trued out at 202 mph. This kind of speed has established the 5-place, 4,600-lb. Cessna Twin as top-notch transportation. It is powered by two 240-hp. Continental engines.

What we wondered about was its short-field capabilities. But this no longer became questionable after our first landing. It was at Las Cruces, New Mexico. We used a short gravel strip, 1,800 ft. long, with a clear approach, slowing the 310 down to 90 over the fence and chopping the power at 80 just before flaring. With the tail low, we stopped the roll short and had almost half the strip left in front of us.

We had come 610 miles from Dallas on the first leg of a trip which would give us some 3,500 miles of travel in a factory demonstrator with Lee Renshaw, western regional manager for Cessna. A 30-mph. headwind had held us down to an average of 170 mph. for this leg, but there was plenty of country ahead including an east-bound return with opportunity for tailwinds.

There's a new 310 based at Las Cruces' small field, and its owner, Rupert Chisholm, had seen us circle the town and was out to meet us. A contractor and a private pilot, Chisholm had acquired his 310 six months earlier and had logged 150 hours on it. This was on trips to Alaska, Seattle and California. "The more I fly it, the more I like my 310," he told us. "I like it just as much as I liked my Navion, as far as handling goes. In speed, nothing will touch it because I looked over a lot of airplanes before I bought the 310. I'm working on my commercial rating now."

We back-tracked to El Paso and spent the night with Wayne Champney, the Cessna distributor there, parking our 310 among three other new Cessna Twins. More and more 310's are being seen around the country — 228 of them were delivered in 1955.

Next morning we headed for California and had a better break from the wind. Off from El Paso International Airport at 9:57 a. m., we used the 310's mileage-eating cruise climb of 145 mph. indicated air speed, getting to 8,000 ft. in 7 mins. and cruising out with 21.5 inches of manifold pressure and 2,200 rpm. for 57.9 per cent of power. This gave us an indicated air speed of 175 mph. and a true air speed of 204 mph. The check-points began rolling by at a 200-mph. clip until the headwind began working up a few notches west of Phoenix, our

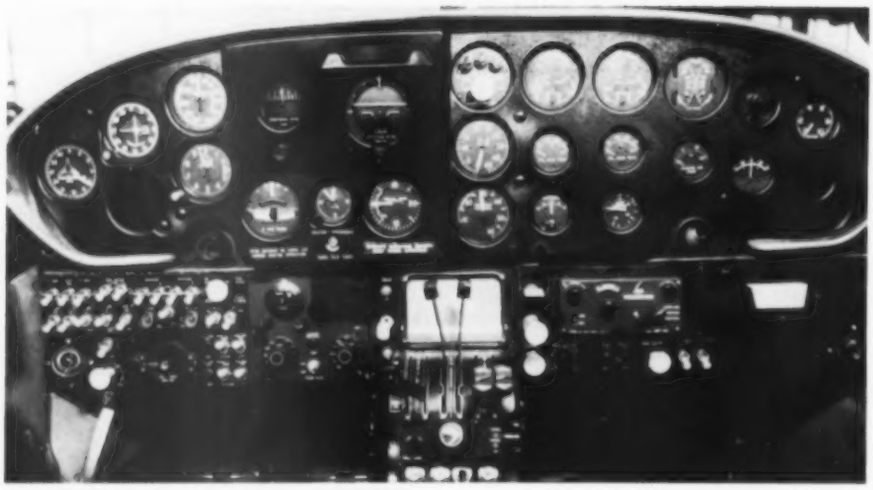
We found other Cessna 310's busy — here are three ready to go on George Crockett's ramp at Las Vegas. Picture at right shows Cessna 310 Owner Jim Cashman and his wife and Peggy and George Crockett swapping performance figures. By a tip tank on his 310 below is Wildcatter John Myers, long-time engineering test pilot for Lockheed and Northrop. Myers considers the 310 outstanding for efficiency.
—(FLIGHT MAGAZINE Photos.)

ground speed slipping off at the Colorado River.

We were bound for Long Beach but it was reporting a 500-ft. ceiling with 1.5-mile visibility, so we stopped for lunch at Palm Springs just outside of San Gorgonio Pass, landing at 1:07 p. m. to cover the 605-mi. leg in 3 hrs. 10 mins. for an average ground speed of 194 mph. After lunch, it was a smooth climb up through the Pass to top the Los Angeles haze at 7,000 ft., and we landed at Long Beach, 110 miles from take-off, 43 mins. later. Instead of going on in, we had spent a little time to see how the 310's Lear L-2 autopilot worked with an automatic approach coupler. Visibility had improved to 3 miles and the coupler did an excellent job, as we could see the end of the runway right on the nose when we took over for the landing. In addition to this marvelous aid, the L-2 also had an altitude controller which we were using for cruise, and it was performing perfectly.

Long Beach is the home of Cessna's top distributor, Larry Hunt, whose firm is Air Oasis. Among the new 310 owners on the ramp when we were there was John W. Myers. Johnny was senior vice president of Northrop Aircraft until recently, when he resigned to enter the oil business as a wildcatter

We heard enthusiastic reports on 310's from private pilots who own them. One is Farmer Andy Marks of Salinas, California (above) and another is Rupert Chisholm (below), a contractor, of Las Cruces, N. M. They are shown with Lee Renshaw of Cessna. Marks is 67 years old and uses short strips in Wyoming and Utah. He traded in a Cessna 195 on the 310, which he says is easier to fly than the 195. Chisholm compares his 310 handling characteristics to those of a Navion he traded in. He has made a trip to Alaska in his 310.
—(FLIGHT MAGAZINE Photos.)



Cessna 310 panel groups primary flight instruments conveniently. Switches and radio controls are grouped below main panel. Loudspeaker is at center behind pedestal. Dual control columns were removed for this photo. At left is a factory picture showing large number of plastic parts used in 310.

in the Rocky Mountain area. He had been with Lockheed for 13 years and was a Lockheed engineering test pilot before he joined Northrop to figure prominently in several notable Northrop projects.

"I had a larger twin but swapped it in on the 310 when I began comparing the two," Myers told us. "With almost half the horsepower, the 310 gives me equal or better performance. That's progress in any language and it means simply that the 310 is a modern and extremely efficient airplane — they've packed everything in tight to cut down on frontal area but I can still carry the equivalent of the equipment I had in the larger twin."

Because Johnny has dealt in such things for so long, we asked his opinion of the 310 as a design. "It has the right combination of power loading, wing loading and aerodynamic cleanness so that it combines speed with short-field ability, economy, stability and comfort," he said. "Its good power loading of only 9.6 lbs. per hp. gives excellent acceleration so that I can get out of any place I can land — and I can put the 310 into small fields with ease. Its wing loading of 26.2 lbs. per sq. ft. is high enough to smooth out rough air for comfort and efficiency. As for aerodynamic cleanness, I believe it is one of the most efficient designs I have known."

We looked into the 310's cleanness and learned from Cessna's engineering department that the airplane's flat plate frontal area is a scant 3.8 sq. ft. Its lift-over-drag ratio is 12.6, which holds drag to a minimum. A Cessna spokesman told us: "It is actually the equivalent to a rod only .85-inch diameter the length of the wing span." All of which shows how neatly Cessna packaged the 310 as a design — its engine nacelles, for example, are less than 21 ins. deep. Viewed from the opposite end of a runway, a landing 310 appears to be either single-engine or a jet, because the nacelles are so small they blend into the wing.

This gives the 310 a "fast" look. Viewed from the side in a landing, it appears faster than it actually is. Such was our experience, for our approaches and landings were made at the same speeds as are used for other light twins. The 310's advertised landing speed with flaps is 69 mph. It will land over a 50-ft. obstacle in 1,720 ft., 620 ft. of this being ground roll. On take-offs, a slight back pressure at 60 mph. gets the 310 into the air where it accelerates rapidly past its single-engine minimum control speed of 93 mph. It will take off over a 50-ft. obstacle in 1,405 ft., 795 ft. of this being ground run. It has a rate of climb of 1,700 ft. per min. and better. These figures are for sea level and 4,600-lb. gross wt. Empty wt. is 2,850 lbs.

These were the points, as well as speed, which John Myers stressed in describing the 310 as an outstanding airplane for business flying. After we left him, our trip confirmed his opinions even more than it had before we reached Long Beach. Four of us made the trip — the authors and Lee Renshaw and Bob Chatley of Cessna.

On to Oakland in 1 hr. 58 mins. to cover the 385 miles on an instrument flight plan via Bakersfield and Fresno, we flew down to Salinas, near Monterey, next morning and met an interesting Cessna 310 owner who is a 67-year-old farmer, Andy Marks. With scattered farm, timber and mining interests, Marks provided an interesting contrast to John Myers because he has been flying only 8 years. "My oldest boy went to flying in 1946 and I had to learn, too, to show him I was still boss. I bought a Stinson and then a Cessna 195. Last March I swapped the 195 for the 310." He told us the 310 is easier for him to handle than the 195. "I get a laugh out of hearing people who don't know better describe the 310 as a hot airplane," Marks said. "If an old farmhand can get around in it as I do, then anybody can. I go

(Continued on page 44)

We found crowded but excellent shop facilities for Cessna owners on our trip. This scene is at Distributor Larry Hunt's Air Oasis, Long Beach, California.

With 340-hp. supercharged Lycoming engine, Temco Model 58 has power loading of less than 9 lbs. per hp. It is a private-venture trainer for export to friendly governments. —(Temco Photo.)

New Dual-Purpose Temco Trainer

A high-performance, dual-purpose lightplane military trainer for primary flight and armament instruction has been developed by Temco Aircraft Corporation at Dallas and is being demonstrated to friendly foreign governments for possible sales and export.

Known as the Temco Model 58, the tandem 2-place has an unarmed gross weight of only 2,993 lbs., a maximum gross weight of 3,600 lbs. with armament, and is powered by a new supercharged 340-hp., 6-cylinder Lycoming engine driving a 3-bladed Hartzell constant-speed propeller. This gives it a power loading of less than 9 lbs. per hp. for outstanding performance, and engine supercharging provides sea level power up to an altitude of 8,000 ft. Service ceiling is over 25,000 ft. and cruising speed is listed at 174 knots, or about 200 mph., at 10,000 ft. using 75 per cent of rated power. Top speed is 185 knots.

An all-metal low-wing tricycle, it is equipped with a powered bubble canopy and I. Nevin Palley, engineering vice president of Temco, said it was designed and developed at company expense to meet the training requirements of foreign governments. It features complete provisions for instructing students at an early period in their introduction to various types of aircraft armament.

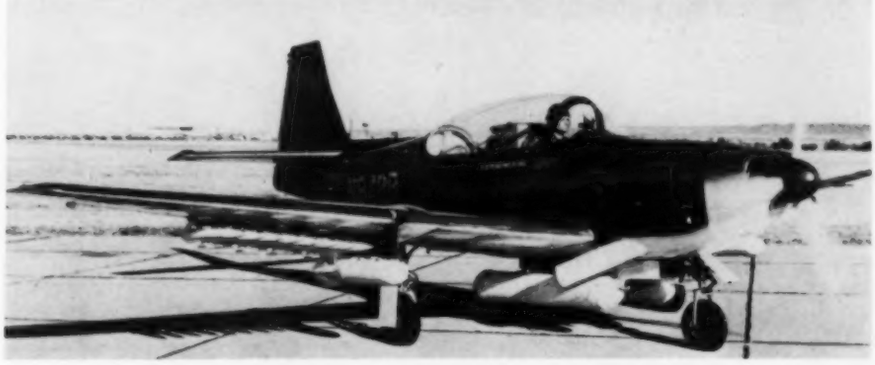
The Model 58 trainer has built-in installations for two .50 or .30-cal. machine guns, two napalm bombs, two 100-lb. general purpose bombs and sixteen 8-cm. rockets. It may be transformed in less than one day's time from its clean configuration to a heavily armed aircraft.

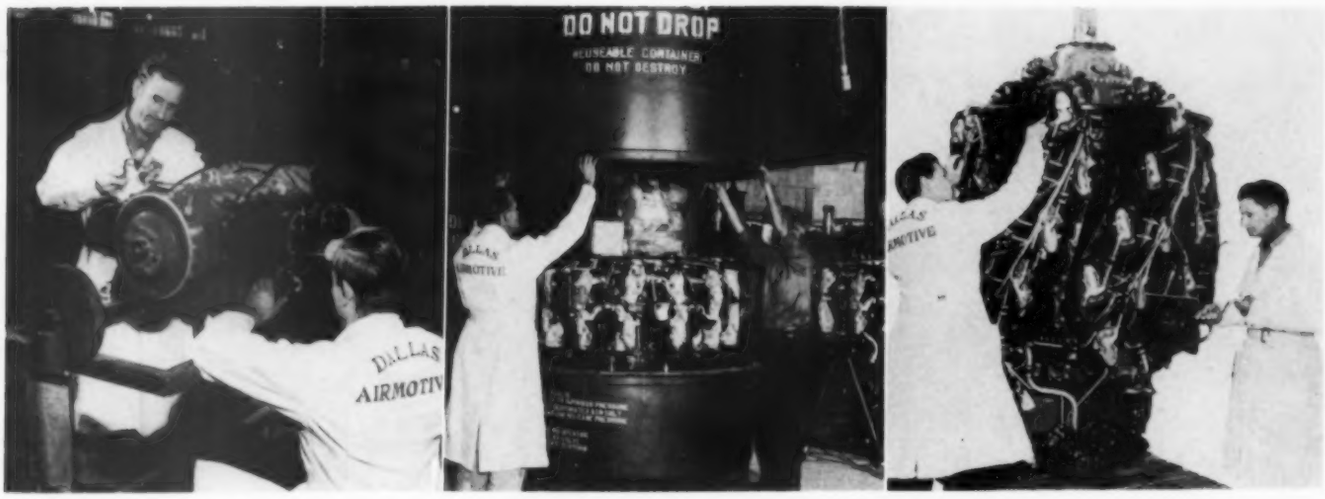
Economical production and maintenance provisions feature the design. Major sections of the airplane may be replaced in the field in a minimum of time without specialized equipment, Temco says. ★ ★ ★

TEMCO MODEL 58
Factory Data

Power Plant: Supercharged 6-cyl. Lycoming GSO-480-AIA engine, rated at 340 hp. at 3,400 rpm.	
Top Spd., 10,000 ft., kts.	**185**
Cr. Spd., 75% hp., 10,000 ft., kts.	**174**
Max. Dive Spd., kts.	**250**
Rate of Climb, fpm.	**1,820**
Svc. Clng., ft.	**Over 25,000**
Stall Spd., kts.	**61.2**
Fuel, gals.	**50**
TO to 50 ft., ft.	**Within 1,080**
Land from 50 ft., ft.	**1,440**
Limit Ld. Factor	**5**
Ult. Ld. Factor	**7**
Gr. Wt. Armed, lbs.	**Up to 3,600**
Gr. Wt. Unarmed, lbs.	**2,993**
Empty Wt., lbs.	**2,270**
Useful Ld., lbs.	**723**
Span, ft.-ins.	**33-2.6**
Length, ft.-ins.	**25-10**
Height, ft.-ins.	**9-10**
Wing Area, sq. ft.	**156.8**
Wing Ldng., lbs. sq. ft.	**19.1**
Pow. Ldng., lbs. hp.	**8.8**

Temco trainer's normal gross weight of 2,993 lbs. is boosted to 3,600 lbs. with the armament shown below — bombs, rockets and wing-mounted machine guns. It is equipped with powered canopy for 2-place tandem cockpit. Engine supercharging delivers sea level power up to 8,000 ft. —(Temco Photo.)





From the smallest flat engines to the largest 4-row radials, Dallas Airmotive overhauls aircraft engines for the U. S. Air Force, Navy, Coast Guard, CAA, trunk and feeder airlines, helicopter and corporate aircraft operators, private operators and foreign airlines and air forces.

Global Engine Overhaul Center

THE sun never sets on Dallas Airmotive-overhauled engines flying the world's airways.

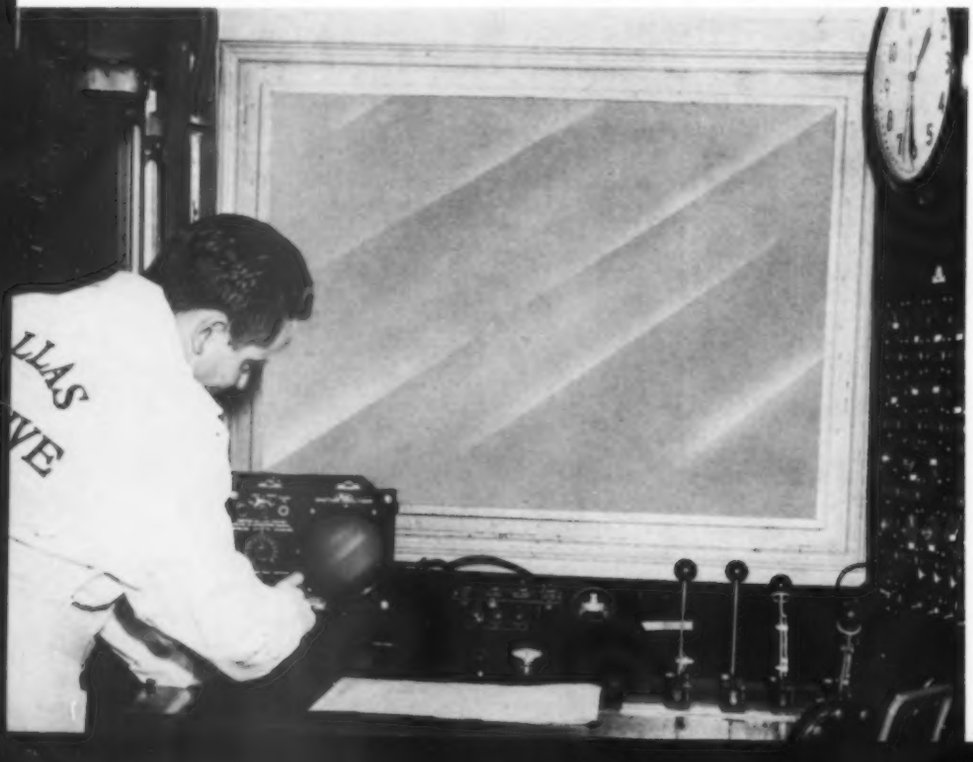
Every day commercial and military customers crank up and fly some 1,500 engines that have been majored in Dallas Airmotive's huge shops now understood to be the largest contract overhaul shops on the globe.

These facts would not be so impressive if viewed only from the standpoint of the air transportation revolution that has taken place since the end of World War II. Everyone knows the role our American engine overhaul companies have played in this tremendous transportation boom. What does impress one in this particular case, however, is the fact that Dallas Airmotive only became a corporate entity back in 1949.

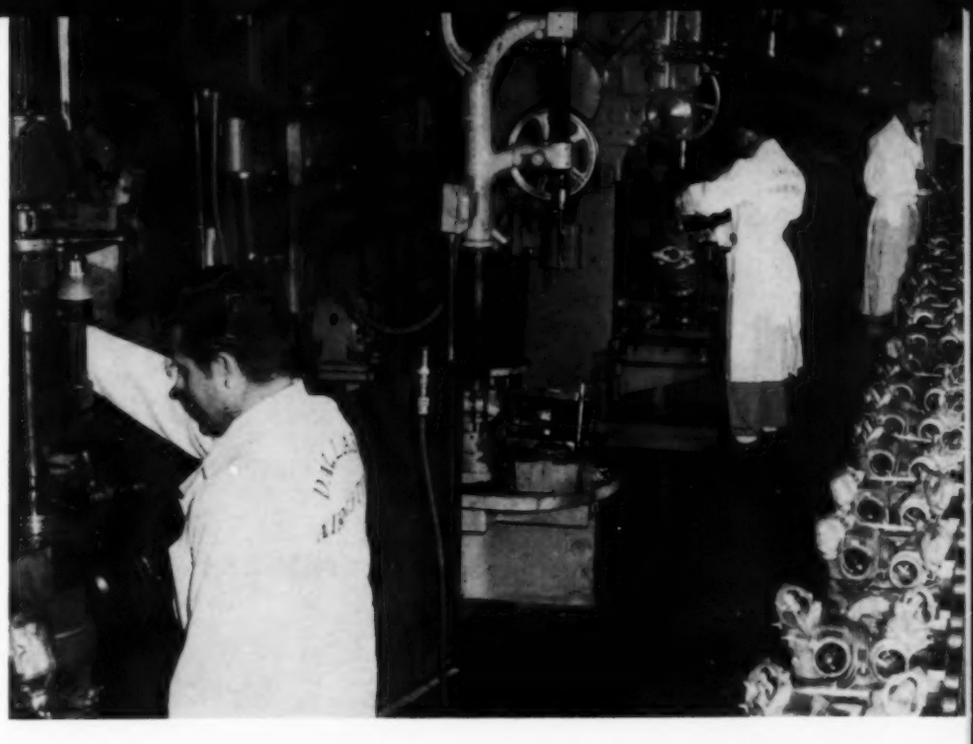
The company grew out of a small band of aviation entrepreneurs who had wisely invested heavily in surplus aircraft engine parts. Their business mushroomed as did other surplus parts enterprises that knew what to buy and how much to pay for the military surplus. But it wasn't long before aircraft and engine utilization far exceeded major overhaul shop capacity. Quick to see this rich opportunity the partners who had earlier built up one of the largest engine parts depots in the country immediately invested their returned capital and profits into what they termed as "the best engine shops money could buy."

From a small shed and parts warehouse on Forest Park Road a few miles from Dallas' Love Field, the company has grown to some 265,000 square feet of floor space on eight acres with approximately 300 employes. At the peak of commercial and military overhaul contract operations they turned out 320 engines per month, most of which were the heavy horsepower radials. This amounts to 16 per working day or an annual total of 3,840 engines with an aggregate horsepower of 3,987,250.

In talking with Henry McGee, Jr., its co-founder and president who is just now approaching the ripe old age of forty, and after a tour of the vast shops, you get the distinct impression that the main objective at Dallas Airmotive is skilled workmanship reaching for perfection — the way it ought to be when it comes to dealing with an airplane's heart — the engine. The assembly line techniques employed reveal speedy production without mak-



Four air-conditioned engine test-stand control rooms are required at a production rate of as many as 16 engine overhauls daily. Ignition anaylzer monitors engine throughout test run. Without stopping engine or leaving his station, control technician can perform and check all engine operations, including check of oil screen and changing from running oil to pickling oil.



Complete cylinder overhaul is one of the shop's most elaborately equipped activities, utilizing factory set-up for precision workmanship and mechanized efficiency. This scene shows one small segment of the cylinder shop.

ing haste, efficient utilization of manpower and machines without sacrificing quality.

In many cases when current practices in disassembly, inspection, reworking or testing prove limited or unsatisfactory, Dallas Airmotive develops its own techniques and equipment. A typical example of such ingenuity was found in some trouble all operators have had with R-985 and 1830 series engine cylinders rusting after being prepared for long-time shipment or storage after overhaul. They solved the problem by engineering a special pickling machine which eliminated the temperature control problem and the use of a bucket for the job. The pickling machine found a ready market in other engine shops throughout the world.

"Our shop finds that about 25 per cent of all engine parts going through the materials and tolerances tests are acceptable for use as they are. About 60 per cent require re-working, and the other 15 per cent are unfit for further use," McGee said.

Long lines of modern machine tools await the parts as they are channeled into the re-working shop. Veteran machinists handle them here with a watchmaker's care, and they emerge with the strength and tolerances of brand new factory made parts. Typical of Dallas Airmotive workers is E. L. (Pop) Whitmore, who was boring link rod piston pin bushings when we stopped to interview him. Past seventy and a machinist of the old school, Pop proudfully boasted that out of the last 2,300 engines he had worked on not one reject had been experienced.

McGee pointed out that the average engine scheduled through the shop requires about 23 working days. In an emergency this can be cut to one week in some types of large engines. At full tilt with present capacity, the company can turn out a zeroed engine every 26 minutes of a full working shift.

"We handle only engines and their accessories," McGee points out. "We are the only shop in the Southwest to move up from the DC-3 to the DC-4, DC-6 and Convair type engines," he added, "and we overhaul more airline engines than all other Southwest commercial shops combined."

Contract customers include in addition to local service and trunk airlines several large helicopter operators, corporate fleet owners, friendly foreign airlines and governments, the CAA and the various military services. In recent months facilities have been installed for overhauling the new flat engines powering the nation's business aircraft fleets. Entry into this growing field will increase the company's annual output by substantial proportions largely due to the many light twins now being delivered to American businessmen.

Pride of the shops are the four new test stands which rise three stories in 15-inch thick, reinforced concrete of the latest design. We have seen only two other installations as quiet — those of Swissair at Zurich and of KLM on Schiphol Airport at Amsterdam, Holland.

"We'll probably look on all this as obsolete stuff before long," McGee remarked as we scanned the myriad of instruments in the test cell house while the roar of a newly overhauled 1830 engine served as background. "Jets and turbines," he added. "And we'll be ready for them well in advance of the demand that's sure to come."

Dallas Airmotive still does a healthy engine parts business from its huge warehouse which was the incubator for the engine overhaul enterprise in 1949. Parts business during the past four years totalled $4.5 million while engine overhaul amounted to $9 million, or exactly twice the parts gross — an interesting ratio.

At the present time commercial work accounts for 62 per cent of engine overhaul sales with 38 per cent military. McGee hopes to increase the spread considerably during 1956 as he feels a ratio of 80 per cent commercial and 20 per cent military more in line with good business practice. At one time during and shortly after the

(Continued on page 40)

Henry McGee, President
Don Goldammer, Exec. V. P.
Jack Ingram, V. President
Jim Squires, Scty.-Treas.
C. A. Lytle, Plant Manager
Dave Walker, Shop Manager
J. W. Stewartson, Chief Inspector

Great Barrington Airport in the Berkshires of Massachusetts is the center of flying activities for pilots in six towns who like its turf field and friendly operator.

Friendliest Airport In New England

Walter Koladza, former test pilot, is shown (right in photo at left) with one of his customers. His club room is pictured below.

By WALTER F. HARMON

NEW England has its share of large and small airports. A well kept sod field airport on the southwestern edge of Massachusetts is thriving much better than any other of its kind considering its location and amount of original capital investment.

When next you are flying up New England way, drop in on the Great Barrington Airport. You are sure to meet Walter Koladza, airport manager. Rain or shine, when he isn't flying charter or instructing, he is at the field. Days off are for other guys. Walt prefers to stick close to home and tend to business.

If the name rings a bell, it is because during World War II Koladza was a test pilot for Chance Vought. That was when CV was located in Bridgeport, Connecticut. Recently he had occasion to make a business trip to South America. He flew the airlines. At several stops in the Latin American countries, and in the cockpits of the airliners, he met old friends.

Koladza took over the management of the airport on January 1, 1945. He injected an air of friendliness which attracts visiting pilots to return again and again. Great Barrington Airport is nestled in the Berkshire Hills of Massachusetts. The Berkshires are famed for their scenic beauty, New England hospitality, in the summer the Berkshire Festival, in the fall the Great Barrington Fair and year-round restful, peaceful countryside.

Its two sod runways, 2,600 and 2,800 feet long, with all field usable gravel base, make landing a pleasure. A Unicom radio set at the field was a gift last Christmas from the pilots at

the field. Portable lights are available for night landings.

Field elevation is 726 feet. The surrounding hills range anywhere from 1,200 ft. on up to 3,500 ft. which is Mount Greylock some 33 miles distant. Those hills don't bother anybody. Field approaches are excellent. During the summer natural attractions are mountain climbing and swimming or fishing in Green River which borders one side of the field, and horseback riding.

Other nearby towns have their own fields. Yet Koladza's airport attracts pilots. It isn't only the town of Great Barrington (pop. 7,000) that supports the airport. Such towns and cities as Hudson (20 miles) and Albany (45 miles), in New York state, Torrington (35 miles) and Winsted (25 miles) in Connecticut and Pittsfield, (20 miles) in Massachusetts supply lightplane pilots and charter business. An airport which can draw customers from those other cities, which have airports, too, must be on the ball. Albany has a population of 135,000 and Pittsfield 53,348.

For one thing, Walter Koladza believes in letting the public know he is in business. He runs ads in four city newspapers 52 weeks a year. "Spot advertising is no good!" he insists. In one instance he taught a reporter of another city to fly. His only satisfaction was to read the weekly report of his student's lessons written in first person style.

Such promotion nets him a balanced airport business. Throughout the year he finds that half his revenue comes from maintenance and the other half is divided equally between charter work and student flying.

If he isn't there to greet you when you land, it probably will be because he is up flying. But he will be back shortly. If this isn't so, I'll buy you a drink at his ultra modern eight-stool snack bar in the unique Helmet and Goggles Room in his basement.

Before entering the administration building you may note some of the 30-odd planes of all sizes based at the field. Of those, a '56 Piper Tri-Pacer and a Bellanca are two of the airport's own flight line. So, too, are the clipped-wing Cubs.

Chief A and E Mechanic Rocco Traficante, specializes in modifying the Cubs. One clipped-wing version has 40 and a half inches cut off inboard from each wing. It cruises around 100 mph. using the standard Continental engine. You may see other Cubs with sawed-off wing tips. Rocco says that he can store more lightplanes this way into the hangar. All modifications are CAA-approved.

For your customer convenience, two of the latest-model station wagons are available for driving, should you care to go to town.

All three of the hangars and the maintenance shop are in keeping with the Koladza-Traficante standard of spotless housekeeping. The combination administration building and neat, modern four-room house which Koladza and his attractive wife, Louise, built, you must see.

Model planes of all types hang from the ceiling of the outer office and pilot ready room. They appear to be poised ready to fly out through a large picture window overlooking the field. Pilots, sons of pilots and enthusiasts made the models and hung them to be admired.

Next time you hear the remark, "As phoney as a three-dollar bill," you will have an answer. Among the short snorters and stray legal tender notes in evidence is a three-dollar buck. It was issued by the Bank of Macomb County, Ohio. All the assorted bills, about $200 worth, are pasted on the ceiling over the bar in the Helmet and Goggles Room. They range from a U. S. $100 bill down to a lowly Colombia, S. A., half-peso. That C note came from an elderly patron who insists that she has paid her tab in advance for the rest of her life. Every item of folding green was donated by a local pilot or visitor to the Great Barrington Airport.

So, too, were almost all of the furnishings of the knotty pine Helmet and Goggles Room. Over the duplex 12-foot fireplace is a model of the destroyer escort, Lovelace. It came from a port in the South Pacific. Next to it are steins from all parts of the world. A four-foot-high nightclub piano, the same type used by Hoagy Carmichael, came from the Waterbury, (Conn.) Press Club. Plush divans and chairs are for relaxing while hangar flying or enjoying the TV console or the console phonograph.

An unusual coat of arms adorns one wall. Its depicted heritage originates in this, the 20th, century. Featured are a shield between two stags. In the shield are a Corsair, parakeets (Louise loves them), an open-winged eagle. Beneath is a motto, "Ad astra per aspera." Koladza says, "Freely translated it means, 'To the stars the hard way'."

In place of a guest register, you may autograph any one of the unfinished, square columns around the room which run from the floor to the ceiling. Yours will be among such other notables as: TV Star Mary Beth Hughes (her hubby, Dave Street, is the pilot); Vaughan Monroe (he was one of Walt's students); jockey Sam Rennick; Lyman Bullard (Chance Vought chief test

(Continued on page 42)

Andrau Expands For Business Flying

IF you're ever flying in the vicinity of Houston, Texas — about 15 miles due west of Houston to be exact — drop a wing and rest your tired peripheral vision on a honey of an airport.

Even if you've seen Andrau Air Park before it will look different to you because something new has been added: the North-South runway has been lengthened from 3,200 to 5,000 feet; the East-West from 1,800 to 3,000 feet.

Bob Wolfe, congenial owner-manager of Andrau, says the new extensions (a $100,000 project just completed) make the Air Park the largest privately owned commercial airfield in Texas, able to accommodate any existing executive aircraft.

Fifty feet wide, the runways are surfaced with black-top asphalt based with stabilizing shell. This combination offers an exceptionally hard, smooth, long-lasting surface, especially suited for the Houston climate.

"Steadily increasing business has made our expansion both possible and necessary," Wolfe said. "Executives almost have to fly to handle business efficiently in this part of the country, and they want facilities tailored to their requirements, rather than to those of major airlines and the military. We fill that need."

Andrau Air Park started in 1947 as a private strip for one aircraft. Due to its advantageous location it grew rapidly. Today, Andrau is a commercial operation involving 18 employes, over 80 based aircraft, and a 550-acre field.

Andrau operates on a twenty-four hour basis, specializing in transient and local executive aircraft business. Services include runway lights, rotating beacon, low-frequency homing beacon, complete major and minor repair service, a radio shop, all-octane gassing, weather reporting, neon-lighted tetrahedron, Unicom frequency monitoring, and transportation to and from downtown Houston.

"In addition to the runway extensions, we've expanded our cafeteria facilities and remodeled our office space," Wolfe added. "We have plans to construct hangars capable of housing thirty additional aircraft."

THE FEATHERED HERON WITH TWO OF ITS PROPS STOPPED is shown in this photo of the small 4-engine de Havilland business plane and miniature airliner. Herons have heretofore been equipped with non-feathering propellers. With four small engines of 250 hp. each, the feathered Heron has a 13,150-lb. gross weight and a 13,000-lb. landing weight. Its rate of climb at gross and from sea level with one propeller feathered is 650 fpm. Some 100 Herons have been delivered, mostly to airlines. The executive version has 500-gal. fuel capacity and consumes only 50 gals. per hour at an economical cruising speed of 183 mph. at 8,000 ft.

AIR REPORT

(Continued from page 10)

ALLISON'S 100,000TH AIRCRAFT ENGINE, a T-56 turboprop, was manufactured last month.

COWL FLAPS HAVE REPLACED EXHAUST AUGMENTORS on the 4-pl. Mooney Mark 20, now being produced at a rate of one every four days at Kerrville, Tex., with a rate of 11 monthly scheduled by April.

THE FULTON AIRPHIBIAN project is for sale. CAA certificated, the Airphibian has a 165-hp. Franklin engine, seats two persons, grosses 2,100 lbs. and cruises 110 mph. It is a roadable airplane.

AIRWORK HAS OPENED A NEW ACCESSORY OVERHAUL SHOP at its Atlanta branch in charge of John Stribling to meet growing needs of business aircraft, airlines and operators in the South. It will maintain large stocks of exchange accessories.

AGRICULTURAL AVIATION developments will be reviewed at the February 26-28 sessions of the 5th Annual Texas Agricultural Aviation Conference and Short Course on Pest Control, College Station, Texas.

RING-WING AIRCRAFT DESIGN STUDIES are being made by Kaman Aircraft of Bloomfield, Conn., a helicopter manufacturer, on Navy contract. In this design, a barrel-shaped wing completely encloses the aircraft fuselage and the craft takes off and lands vertically as a helicopter while cruising as an airplane.

LEAR HAS PROMOTED HENRY HAMM AS INTERNATIONAL SALES MANAGER and he has been succeeded as commercial sales manager by **PAUL MOMENTELLER**, formerly midwestern representative. **TOM MITCHELL** has been named eastern regional sales manager.

ROY THORSON has been promoted from sales representative to sales manager of the Camair Division of Cameron Iron Works, manufacturers of the Camair 480 Twin Navion conversion.

A NEW HOWARD JOHNSON RESTAURANT is now open for the flying public on Stewart Air Park at Parkersburg, West Virginia, according to B. D. (Bun) DeWeese, manager of the field. Stewart Air Park also has a 15-room air-conditioned Sky Motel for fliers.

FLYING WEATHER BROADCASTS on continuous tapes will be inaugurated at 21 locations in 1956, listed by CAA as follows: Los Angeles, Albuquerque, Atlanta, Boston, Chicago, Cincinnati, Cleveland, Denver, El Paso, Ft. Worth, Indianapolis, Kansas City, Memphis, Minneapolis, New Orleans, New York, Oakland, Pittsburgh, Portland, Seattle and St. Louis. It has been inaugurated at Arcola, Va.

A 10-STORY BRANIFF AIRWAYS OFFICE BUILDING will be constructed near Love Field in Dallas, where the airline is also constructing a new multi-million-dollar base.

A NEW CESSNA 310 POOL LEASE PLAN has been inaugurated to facilitate distributor-dealer 310 demonstrator acquisitions.

TOP 10 CESSNA DISTRIBUTORS sold $12.8 million worth of new airplanes in 1955. They are listed by Sales Manager Frank Martin as follows: (1) Air Oasis, Long Beach, (2) Walston Aviation, East Alton, Ill., (3) Cruse Aviation, Houston, (4) Mid-States Aviation, Northbrook, Ill., (5) Clinton Aviation, Denver, (6) Great Lakes Airmotive, Detroit, (7) Aircraft Sales, Ft. Worth, (8) R. P. Bowman, Oakland, (9) Yingling, Wichita, and (10) Champ's, El Paso.

COLLINS RADIO has named Spartan Aircraft, Tulsa, as an authorized dealer. . . . **McCAULLEY PROPELLERS** has named Don L. Myers Co., Palo Alto, Calif., as distributor. . . . Two new **LEAR DISTRIBUTORS** are Wallace Aircraft, Sarasota, Fla., and Carolina Aircraft, Charlotte.

NEWLY-CREATED AVIATION DEPARTMENT OF BENDIX RADIO is headed by Clarence I. Rice, formerly aviation sales manager.

PACIFIC AIRMOTIVE'S NEW CHAIRMAN AND VICE CHAIRMAN are John W. Myers, former Northrop senior vice president, and B. Allison Gillies, consultant. Tom Wolfe has resigned. Myers said PAC will concentrate on sales distribution and service business. It has sold its Aero-Pneumatics Division to Hamilton Standard Propellers.

AUXILIARY FUEL SYSTEMS FOR CESSNA MODELS 170-180 are being marketed by Javelin Aircraft Co., Wichita. They add 18 gals. of fuel in a baggage compartment tank.

RILEY TWIN NATIONAL DISTRIBUTOR ORGANIZATION is being set up by Temco Aircraft with F. C. (Bub) Merrill as commercial aircraft sales manager. Long identified with aircraft sales and 30 years a pilot, Merrill said factory sales representatives will work with distributors in selling the 175-180-mph. twin, powered by 170-hp. Lycomings. His office is at Temco's Greenville (Tex.) plant.

SALE OF ALL RIGHTS TO THE SEABEE AMPHIBIAN BUSINESS PLANE has been made by Republic Aviation Corp., which produced over 1,000 of the 4-place amphibians before halting production in 1947, to J. K. Downer of Saginaw, Mich. He is forming a new company at Tri-City Airport near Saginaw and will handle parts service and is considering future manufacture of the airplane.

FRANK (BUD) KELLEY, widely known Bell Aircraft commercial helicopter salesman, has resigned from Bell to become executive vice president and manager of Hawk Helicopters, Ft. Worth and Corpus Christi, Tex. **STEVE SPAULDING** has been promoted by Bell to succeed Kelley as sales supervisor in 22 central and southeastern states.

OPTIMUM HELICOPTER INSTRUMENTATION developments in an Army-Navy program coordinated by Bell Aircraft with airframe and instrument manufacturers were reviewed at a classified conference in Ft. Worth last month. ★ ★ ★

YOU ARE *Ahead* WITH CESSNA

IN *Beauty* ... IN *Performance* ... IN *Comfort!*

Cruse Aviation has become a leader in business flying because it specializes in the sales and service of Cessna's complete line of modern, unexcelled business planes pictured here. . . . Tops of the entire field is the FAST, EFFICIENT CESSNA 310 for 5-place travel at speeds over 200 mph. on partial power and with the same outstanding short-field utility which has made Cessna's smaller business planes famous. . . . Performance leader of 4-place aircraft is the POWERFUL, RUGGED AND ROOMY CESSNA 180 for travel speeds well above 150 mph. . . . There's nothing finer anywhere in the low-cost 4-place field than the SPARKLING NEW TRICYCLE CESSNA 172 and its tail-wheel version, the HIGH-UTILITY CESSNA 170. . . . Cruse Aviation specializes in authorized Cessna service — your assurance of satisfaction after the sale. Dependable, economical transportation has made Cruse and Cessna leaders in business flying.

CRUSE AVIATION, INC.

Distributors

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Aviation Accessories

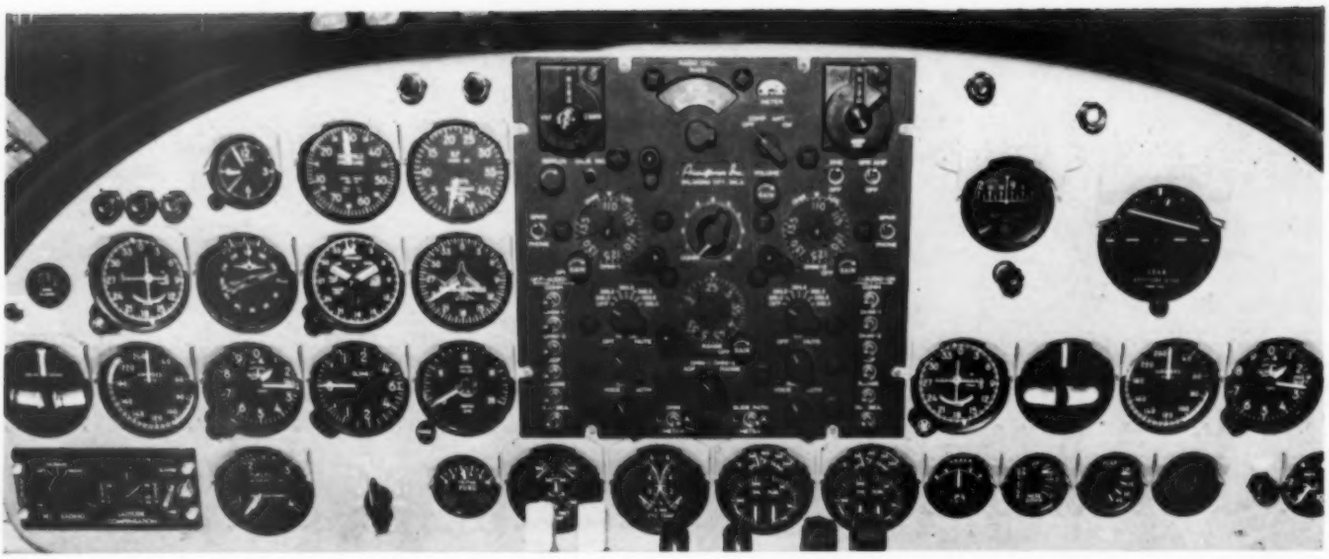
PHONE: SALES—MISSION 52255

SERVICE—MISSION 97311

International Airport and Clover Field Airport

HOUSTON, TEXAS

. . . COMING—A FIFTH CESSNA MODEL to serve your every flying need. See Cruse Aviation for full details on the NEW TRICYCLE CESSNA 182.



New Nafli indicator is located beneath clock on this Aircraftsmen custom panel and its gyro control panel is at lower left beneath turn and bank. This Beech panel also features an ARC Model CD-1 course director, a Narco DME and a custom edge-lighted radio console at center. Equipment includes Lear LVTR-36, Lear ADF-14C, two ARC 15D omnis, ARC T21 transmitter, two glide slope receivers, ARC F11A isolation amplifier, Lear 2200 marker beacon receiver, ARC R-20 marker receiver and ARC R11A range receiver, with Lear L-2 autopilot having altitude control and automatic approach coupler. The approach can be controlled by either of dual localizers or dual glide slopes or by crossing information from all four units.

—(Aircraftsmen Photo.)

"Nafli" Simplifies Instrument Flying and Panel

SOMETHING new has been added to the primary flight instruments on the Super 18 Beech custom panel pictured above. It is the "Nafli," or natural flight instrument, a new, simplified system of blind flying instrumentation developed by Lear. In the panel above, it is located beneath the clock and between the cross-pointer and the new ARC course director.

This installation, made by Aircraftsmen, Inc., Lear distributor at Oklahoma City, in a new Super 18 owned by Jack Bates of Tulsa and flown by him and Bob Eddings, is one of the first Nafli installations in a business airplane. A close-up of the Nafli indicator is shown at right, with its gyro control panel pictured below.

Described as an "ADI," for attitude and direction indication, this new system combines in a single instrument the same indication ordinarily presented by two larger instruments, the directional gyro and the gyro horizon indicator. A 3-in-1 indicator, it shows (1) whether the aircraft is diving or climbing and at what angle, (2) whether it is bankinng to right or left and to what degree, and (3) the direction the aircraft is heading on an azimuth scale.

Attitude is indicated by pointers representing the aircraft in silhouette, one a side view to indicate nose up or down for pitch and the other, viewed as looking forward from behind the aircraft, indicates bank or roll by the attitude of the wings. In addition, the roll pointer and heading card work

Lear Nafli triple indicator is shown above, while control panel for Nafli gyro setting is below. Small aircraft side view indicator is for pitch (nose up or down) and rear-view aircraft indicator is for bank or roll, in unison with heading card behind it. For precision turning, wings are banked until new heading comes up behind roll pointer, the two being held superimposed while degree of turn is decreased until bank becomes zero.

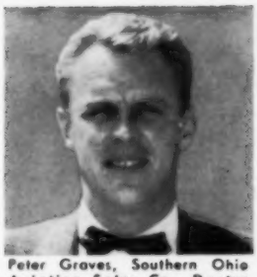
in unison so that when turning, bank and heading are read together. The airplane is held in a bank until the desired new heading is read on the gyro-operated compass card directly behind the roll pointer. The turn is completed by decreasing the bank as necessary to hold the roll pointer and new heading indication superimposed. The bank becomes zero as the new heading is assumed, resulting in a precisely-executed turn.

"It takes only a few minutes to become familiar with the presentation and then those who have flown under the hood with it agree that its simplicity and naturalness can make marginal instrument pilots safer and experienced instrument pilots even more proficient," commented Norman Blake of Aircraftsmen. "It does not exaggerate airplane movement as much as the driectional gyro or the artificial horizon, and there is no tendency to chase it. The Nafli is very accurate even on slight changes—although you still want to check your other instruments, you can maintain attitude indefinitely without looking at the other instruments. Because of this, the Nafli greatly simplifies the panel and therefore is a valuable development." He said pilots with little or no blind flying experience have learned after only ten or fifteen minutes to climb, descend, turn and establish a preselected heading. Instrument pilots have found

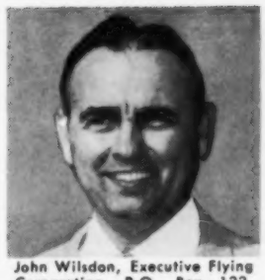
(Continued on page 43)

Don Vest, Vest Aircraft & Finance Co., P. O. Box 5306, Sky Ranch Airport, Denver, Colorado.

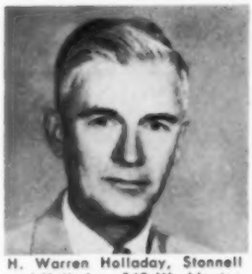
Gene Hudman, Stonnell and Holladay Aircraft Sales, Carolina Division, Municipal Airport, Charlotte, North Carolina.



Peter Graves, Southern Ohio Aviation Sales Co., Dayton Municipal Airport, Vandalia, Ohio.



John Wilsdon, Executive Flying Corporation, P.O. Box 122, Lambert Field, St. Louis, Missouri.

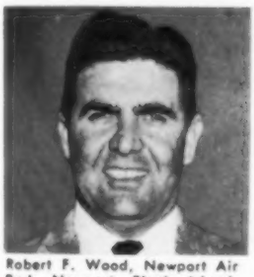


H. Warren Holladay, Stonnell and Holladay, 843 Washington Building, Arlington Towers, Arlington, Virginia.

H. Laibee Wheeler, Buffalo Aeronautical Corporation, Buffalo Municipal Airport, Buffalo, New York.

Art Meurer, Arthur Meurer Co., Inc., LaGuardia Field, New York N. Y.

B. G. Vandre, Van's Air Service, Municipal Airport, St. Cloud, Minnesota.



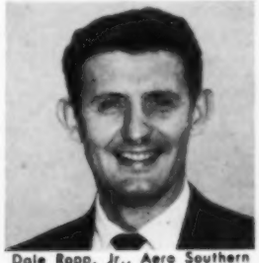
Robert F. Wood, Newport Air Park, Newport, Rhode Island.

A. M. "Sime" Bertolet, Reading Aviation Service, Inc., Municipal Airport, Reading, Pennsylvania.

J. B. Redwine, Fairfax Aviation, Inc., 3301 Fairfax Trafficway, Fairfax Airport, Kansas City, Kansas.

Max R. Brand, Aero Commander Dist. (Downtown Airpark), Hangar 3, Municipal Airport, Tulsa, Oklahoma.

E. H. "Ted" Tolan, National Aero Sales Corp., Midway Airport, Chicago, Illinois.



Dale Rapp, Jr., Aero Southern Corp., 601 Broadway, Nashville, Tennessee.

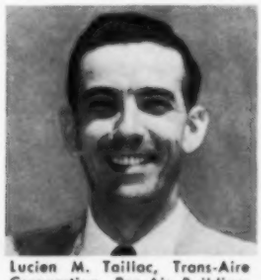
W. H. "Bill" Buchanan, Sales Manager, Johnsons Air Interests, Inc., Horlick-Racine Airport, Racine, Wisconsin.

Louis Humphreville, Executive Aircraft Corporation, Municipal Airport, Pontiac, Michigan.

L. S. McIntire, Vest-Livingston Aircraft, Inc., International Terminal Building, International Airport, Oakland, California.

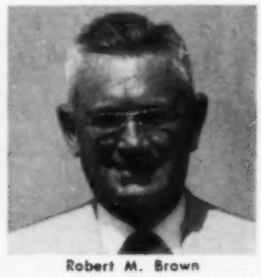
John A. "Jack" Baumann, Santa Monica Aviation, Santa Monica Airport, Santa Monica, California.

Herrol Bellamy, L. B. Smith Aircraft Corp., Miami International Airport, Miami, Florida.



Lucien M. Taillac, Trans-Aire Corporation, Pan-Air Building, New Orleans Airport, New Orleans, Louisiana.

Joseph H. Frost, Jr.



Robert M. Brown

Commander Sales Company, Terminal Building, International Airport, San Antonio, Texas.

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we send our men to the Lear Radio plant periodically

For The Newest Techniques!

Advanced training never ceases for Aircraftsmen's technicians. Regular periods of schooling at the Lear plant, for example, assures superior radio service for your Bonanza or Twin. Our men come back with both new and reviewed Lear service techniques!

You, as our customer, are assured a factory-trained mechanic, or supervision of a factory-trained mechanic, at all times.

Complete Beechcraft Bonanza ACCESSORIES are available at Aircraftsmen Inc. . . . map and thermos cases, curtains, visors, breather oil separators, aileron trim controls, and ten-gallon auxiliary fuel tanks . . . installed by FACTORY-TRAINED, experienced technicians.

Aircraftsmen Inc.

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GLOBAL OVERHAUL

(Continued from page 33)

Korean War the company was up to 80 per cent military. "That's unhealthy," McGee maintains, "and we're going all out for commercial overhaul business as our 1954 and 1955 commercial increases reveal."

Associated with McGee are S. Jack Ingram, vice president and co-founder of the company; Donald A. Goldammer, executive vice president who came with Dallas Airmotive within a few weeks after incorporation; James H. Squires, secretary-treasurer; Charles A. Lytle, general plant manager; David H. (Blackie) Walker, shop manager; and John W. Stewartson, chief inspector.

Oldtimers in the shop are: J. A. Morris, test and final inspection; J. D. Van Gilder,. carburetor shop; J. O. Powell, machine shop superintendent; W. U. Z. Trusty, military assembly line; H. A. Tracy, commercial assembly line; Lou Downard, detail parts inspection; Buddy Powell, magneto and harness department; R. O. Stephenson, disassembly and cleaning; T. J. Powell, stores superintendent; R. E. Tucker, military parts requirements; Slim McCain, cylinder shop; D. R. Mathis, purchasing agent; and J. D. Snelling, in charge of parts sales.

★ ★ ★

Airmen's Calendar

Feb. 16-17—10th Annual Illinois Flying Farmers Clinic, University of Illinois.

Feb. 18—American Helicopter Society Meeting, Fort Rucker, Ala.

Feb. 20-21—Midwestern Regional Lear Distributor Sales Meeting, Aircraftsmen, Inc., Oklahoma City.

Feb. 22-24—Fifth Annual Ohio-Indiana Agricultural Aviation Conference, Ohio State University Campus. For information, write Ohio Aviation Board, 501 Wyandotte Building, Columbus, Ohio.

Feb. 23-24—Central Region Lear Distributor Sales Meeting, Skymotive, Inc., O'Hare Field, Chicago.

Feb. 23-26—La Fiesta de las Vaqueros Fly-In, Tucson, Arizona.

Feb. 26-28—5th Annual Texas Agricultural Aviation Conference and Short Course, Texas A&M College, College Station, Tex.

Feb. 28-29—Eastern Regional Lear Distributor Sales Meeting, Sunny South Aircraft Service, Ft. Lauderdale, Fla.

Mar. 6-8—First Annual Fly-In Convention, Flying Physicians Association, Rex N. Carr, M.D., 2007 Pine St., Redding, Calif., Arrangements Committee. Hotel Del Prado, Mexico City.

Mar. 14-16—Aviation Division Conference, American Society of Mechanical Engineers, Beverly-Hilton Hotel, Los Angeles, Calif.

Service Designed For Business Flying

Cessna aircraft owners fly more hours per month and cover more miles of territory per hour than ever before — because their Cessnas were designed for service efficiency in the air and on the ground.

Business fliers stay on the go more by depending on our Authorized Cessna Service to keep their aircraft always ready for reliability, performance and comfort. We know their needs best because our factory-approved facilities and staffs specialize in factory methods, equipment and accessories.

Get the most out of your Cessna by taking advantage of the three important service features guaranteed by our factory-supervised Cessna Flat Rate Program:

1. You get an accurately quoted price and time-required quotation based on hundreds of job studies covering virtually all maintenance needs.

2. You get genuine Cessna parts and factory-trained workmanship.

3. You save money and time and we stand behind every job for your fullest satisfaction.

To make the most of your Cessna's usefulness, visit the Authorized Cessna Service Stations listed below.

These progressive Cessna Authorized Service Shops offer flat-rate service.

Aircraft Sales Company
Meacham Field
Fort Worth, Texas

Champ's Aviation, Inc.
Municipal Airport
El Paso and Lubbock, Texas

Clinton Aviation Company
Stapleton Airfield
Denver, Colorado

Cruse Aviation, Inc.
International Airport
and Clover Field Airport
Houston, Texas

Dal-Tex Aviation, Inc.
Highland Park Airport and Love Field
Dallas, Texas

Hair Flying Service
Harding Field
Baton Rouge, Louisiana

Howard Aero Service, Inc.
San Antonio International Airport
San Antonio, Texas

Poelman Aircraft Co.
New Orleans Airport
New Orleans, Louisiana

Ragsdale Flying Service
Municipal Airport
Austin, Texas

Kenneth Starnes Aviation Service
Adams Field; Little Rock, Arkansas

Southwestern Skyways, Inc.
Municipal Airport
Santa Fe, New Mexico
and Ogden, Utah

Sunny South Aircraft Service, Inc.
Broward International Airport
Fort Lauderdale, Florida

Walston Aviation, Inc.
Civic Memorial Airport
East Alton, Illinois

Yingling Aircraft, Inc.
Municipal Airport
Wichita, Kansas

FIT FOR A QUEEN is what Yingling Aircraft of Wichita thinks of the Cessna 172. So it presented this new 172 to Alberta Reed of Emporia, Kansas, National Flying Farmer queen, for her travels.

FRIENDLY AIRPORT

(Continued from page 35)

pilot) and Gill Robb Wilson, veteran who needs no introduction.

January first was Koladza's eleventh anniversary at Great Barrington Airport. When he took over, with three other partners who later withdrew, there were four planes based at the field. Bets were on that he wouldn't last a year. His success has not been a cut-rate deal. He still charges $11.50 for dual and $8.50 for solo, which is higher than many other fields. His philosophy is that if a person sincerely wants to fly, he will find a way to afford it.

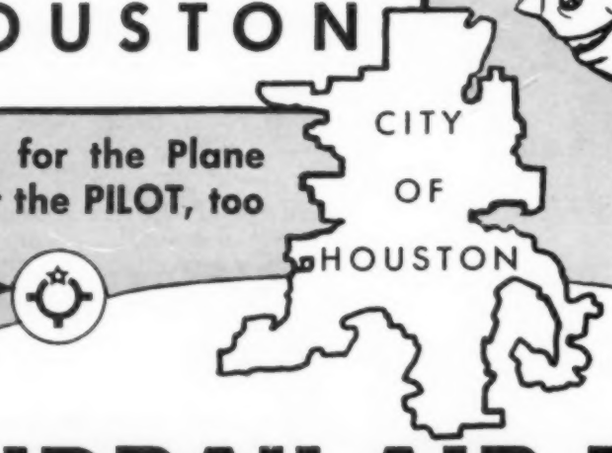
Koladza is all in favor of flying clubs, provided the membership is limited to four. The ideal situation, he says, is a plane owned by partners. Presently there are two flying clubs on the field.

If a town the size of Great Barrington is able to boast an active field and four full-time aircraft and engine mechanics, others can too, says Koladza. He stipulates that a lifetime, or long-term contract is most important.

Great Barrington Airport's next project is one or more model single-room guest cabins. When the first one pays for itself in rentals, then another will be built. The model cabin or cottage, with furnishings, a carport and a courtesy car, will enable visiting pilots to stay over a few days in comfort. Last summer he observed that such convenience would have been much in demand. Perhaps by this summer, the first will be there for you to use. ★ ★ ★

YOUR BEST BET in HOUSTON

Smiling Service for the Plane and we Pamper the PILOT, too



San Jacinto Monument
Biggest Shaft in Texas

ANDRAU RADIO
269 AAP

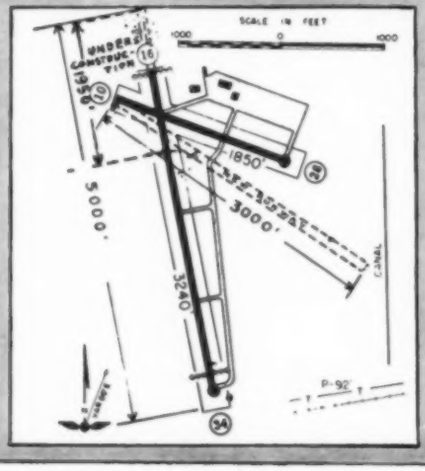
ANDRAU AIR PARK

at Alief, Texas — 15 Miles Due West of Downtown Houston

TRANSPORTATION ALWAYS AVAILABLE

BUILDING A BIGGER, BETTER AIR PARK

New Runway - Extension of Old Runway - Plus many other new facilities



All Parking Ramp Engineers Welcome to drop in and supervise construction.

NAFLI INSTRUMENT FLYING

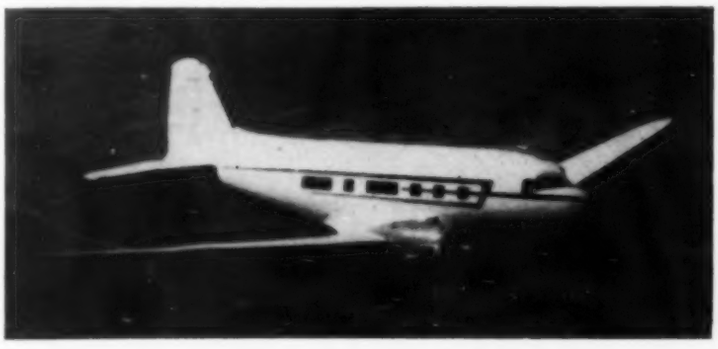
(Continued from page 38)

the Nafli considerably less fatiguing.

Cost of the system, less inverter, is $2,995 plus installation and its weight is less than 30 lbs. The system includes electric directional and vertical gyros and an amplifier assembly for these and associated units, remotely mounted in a ½ ATR assembly with plug-in units for easy maintenance. Its electronic amplifiers are transistorized and utilize etched wiring. In its present package, Nafli represents the nucleus of a 3-axis autopilot but building-block components to complete it as an autopilot have not yet been completed.

The Nafli triple indicator is in a 3⅛-in. instrument case and the control panel for its directional gyro has a manual control for initially adjusting to the magnetic heading when slaving is not employed, for latitude compensation control, and a switch for free or slaved gyro operation. This panel is only 2⅝ ins. high, is edge-lighted, and fits the standard 5-in. console rack.

The system's electric gyros have steel rotors, gimbals, and frames featuring new-type construction to solve problems caused by the differential expansion of dissimilar metals with temperature. The entire system is designed for long life and maintenance-free operation. ★ ★ ★



Super-92 DC-3

in February

with your choice of engines

Super-92

Pratt & Whitney R1830-75, -94, R2000, Wright R1820-56, -72

Bendix or Collins radio, new ship guarantee, complete 8000 hour overhaul, beautiful custom interior, big windows, 200 mph.

C47s

201 to

6402 hrs. total

fresh from complete disassembly

and 8000 hour overhaul

New ship guarantee, NTSO engines

Custom 18

- big, easy vision windows
- special, reclining chairs
- adjustable headrests
- spacious interior
- roomy cockpit
- open design
- clean, modern lines
- bright, restful decor

Immediately available, or will convert your own

All services for executive

DC-3
Lodestar
D18S

Inspections
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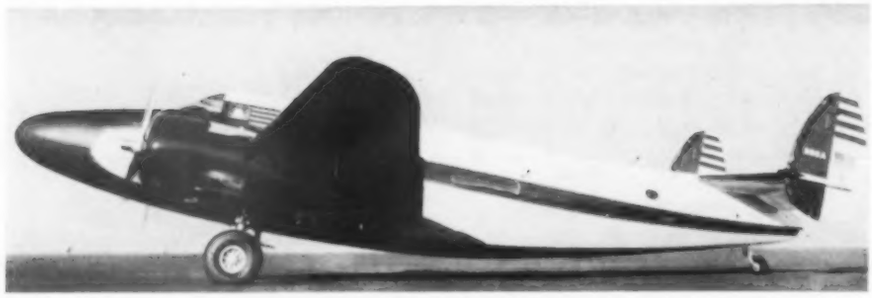

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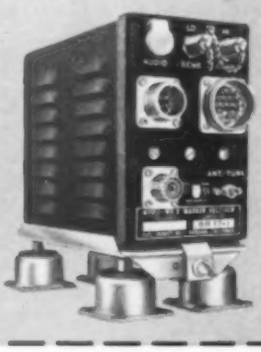

"Fish" Salmon, Lockheed Engineering Chief Test Pilot, knows the value of equipment dependability—it's his job!

Write for illustrated free folder on the MB-3 Marker Beacon Receiver TODAY!

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PERFORMANCE TO SPARE

(Continued from page 30)

over into Wyoming and Utah and I use some 1,800-ft. strips over there. It'll take me anywhere I want to go."

We wanted to talk with another 310 farmer on his strip near Sacramento but recent rains which had ravished that area were starting in anew when we landed at Sacramento to see the beautiful Cessna dealership operated there by Pat Patterson. So we headed home, via Reno. We could see the sunlit snows blanketing the High Sierras but Donner Summit was reporting 100-mph. winds and we stayed off the ridge, having had our teeth jarred by turbulence on far less windy crossings at that spot. As it was, we skipped Reno and enjoyed 2 hrs. and 15 mins. of scenic flying to Las Vegas, staying out of the mountains until we crossed over at Inyokern at 11,000 ft. to average 187 mph. for the 420-mile hop despite headwinds.

It was good to be in Las Vegas because we had wanted for some time to revisit George and Peggy Crockett, who operate Alamo Airways at McCarran Field there. Oldtimers in the airplane business, they set up shop in Las Vegas 15 years ago and struggled about as hard as a Death Valley prospector until 1947, when they began to show an occasional profit. Prosperity didn't chase them out of aviation, as it did some people, and George and Peggy plowed back into their little desert operation every dime they made as the resort boomed into a fabulous gambling oasis extracting $50,000,000 a year from tourists. All the Crocketts knew was the flying game and their success at putting it on a paying basis can be measured by the 40 business planes, including 8 twins, now based there, with George carrying a dozen new and used ones in stock at all times to meet the steady demand. He has a staff of 18 on the payroll and provides living quarters right on the field for most of them while operating 22 motel units there also. For a rapidly growing transient business, the Crocketts own and maintain a fleet of 35 new rental autos including Cadillacs for the sports. Their Chevvies and Fords are cheaper than cabs.

"Business is at least 25 per cent better than it was a year ago," George told us. To keep up with it, he's doubling his hangar space, adding more motel units and a swimming pool with a recreational area. This will make the operation a million-dollar facility. We doubt if it can improve the service there, however — it is already tops and about the most accommodating operation we have ever visited. Las Vegas hotels know this, too, and cooperate

with the Crocketts when it comes to reservations for fliers. For example, we arrived there on a Saturday after dark but a telephone call by George got us into Wilbur Clark's Desert Inn, our favorite, in minutes.

We enjoyed another treat next morning when we met Jim Cashman while preparing to leave for home. Cashman, a General Motors automobile dealer in Las Vegas, owns a Cessna 310. In addition to flying to Detroit several times a year on business, he is a national vice president of the Junior Chamber of Commerce and makes about 15 trips a year to the East as well as numerous hops to West Coast cites.

"I couldn't get along without my own airplane," he told us. "The 310 makes possible a lot of traveling which I couldn't undertake at all any other way. It really gets up and travels. When I took delivery at the factory in Wichita, I headed for Detroit. My eyes liked to have popped out of my head when I averaged 268 mph. on the first leg I flew in the 310 — the wind was blowing pretty good in the right direction. It's the smoothest airplane in turbulence I have ever flown. I call it my magic carpet because that's what it really is to me and my business travel."

Cashman said he had ordered an L-2 autopilot but soon cancelled it "because the 310 is so stable," Crockett confirming to us that he gave Cashman his deposit back. Even so, we'll wager Cashman puts in an L-2 if he ever has a demonstration of the automatic approach coupler like we had at Long Beach. Crockett, who is a Cessna dealer, bought two 310's and ordered another one after he sold Cashman his. He had just returned from a charter trip in the 310 to Palm Beach, Florida, which is quite a hop from Las Vegas. "I never dreamed the 310 was so efficient until I made this trip," he told us. "I had flown it locally but it took a good cross-country to make a real salesman out of me."

We learned what Crockett meant on the way home from his base, for we took the 310 up to 19,000 ft. where the winds, which had been on our nose plenty, would have an opportunity to help us for a change. Renshaw's demonstrator, like so many 310's now being delivered, had a factory-installed Scott oxygen system, this including a high-pressure bottle behind the baggage compartment and a low-pressure distributing system in the cabin. Four of us hooked into it as we climbed above 14,000 ft.

Taking off from Las Vegas at 1:09 p. m., we topped 19,000 ft. an hour out and directly over Grand Canyon Airport, which is 180 miles from the

WORLD'S LARGEST CESSNA DEALER for second year in a row is Dal-Tex Aviation of Dallas, headed by H. O. Wright (left) with Webb Thomas (center) as sales manager. Frank Martin, Cessna's commercial sales manager, is shown congratulating them.

Royal AMPHIBIAN NEWS

Notes on America's outstanding utility amphibian for business flying and charter service operation

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Province of Quebec, Canada

Yes, 35 seconds before this dramatic picture was taken, this standard Royal Gull amphibian was at a complete stop. This scene is on the famous Horsetooth Reservoir, Fort Collins, Colorado, about 60 miles north of Denver. The reservoir's altitude is 5400 feet.

It was on July 18, 1955, at 11:30 a.m., and the outside air temperature was 79° F. We were fully "grossed out" (6000 lbs). The wind was from the north at 5 miles per hour. Royal Aircraft's test pilot, Wally Watson, applied forward pressure to the throttles and with a manifold pressure of 22.0 at 3400 rpm, America's only new twin-engine amphibian was soaring gracefully in the warm Colorado air after a take-off run of only 35 seconds.

A number of other high-altitude take-off tests were also run at a 6780-ft elevation in Rawlins, Wyoming. At 5780 lbs. gross weight, take-off time was 19 seconds from paved surface . . . 38 seconds from the waters of Seminoe Reservoir.

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50,000TH MET-L-MATIC PROPELLER FOR BUSINESS PLANES produced by McCauley Industrial Corp. of Dayton, Ohio, is shown with three men instrumental in this large output. Left to right are Walter Voisard, chief engineer; Vern Deinzer, general manager, and Hugh Schierling, distributor sales manager.

airport at Las Vegas. This was an indication that we would have pretty good sailing. A lot of pilots are flying 310's at 18,000 to 20,000 ft. to take advantage of winds and to over-fly turbulence. Some have told us about the 310's remarkable climbing ability. So we tried it at 19,000 ft. At an indicated air speed of 105 mph. we climbed at 19,000 ft. at more than 350 ft. per min. We knew of a 310 which was climbed to 26,000 ft. at Long Beach.

We were still grossing fairly close to maximum, for our climb had used only about 22 gals. Cruising at 19,000, we had 13 inches of manifold pressure and 2,350 rpm. This gave us only about 38 per cent of power, or about 91 hp. per engine. It also gave us a very low fuel consumption of about 14 gals. per hour. But in speed, we were indicating 125 mph. at first and this gradually worked up to 130 mph. with fuel burnout. Outside air temperature was relatively warm at 8 degrees F., and our speed trued out at 172 to 175 mph. We got a good ground speed check over the airport at Gallup, New Mexico, finding we were making a good 204 mph. The wind was helping. But somebody among us was sucking too much oxygen, or else the tank had been used previously, for it began running low and we started a long descent of about 300 ft. per min. so that we had 14,000 ft. over Kirtland Field at Albuquerque, indicating 168 there, and leveling off to cruise for an hour at 10,000 ft. before landing at Lubbock. We had covered 790 miles from Las Vegas in 3 hrs. 51 mins. to average 202 mph. It took 74.5 gals. to top the tanks. They hold 100 gals.

Back from our starting point in Dallas, we completed our log for the 4-day trip and it came out like this:

Miles flown, 3,545.
Hours flown, 18:32.
Gallons of fuel consumed, 389.4.
Quarts of oil added, 1.
Average ground speed, 192.2 mph.
Fuel consumption, 21.05 gals. per hr.

We asked Cessna's engineering department to compute the percentage of power we had used from the settings we recorded. It turned out that we had never used more than 60.6 per cent of rated horsepower for cruising. Yet we averaged better than 190 mph. ground speed for the 3,545 miles and our fuel consumption averaged just barely over 21 gals. per hr. It all adds up to outstanding efficiency for a light twin.

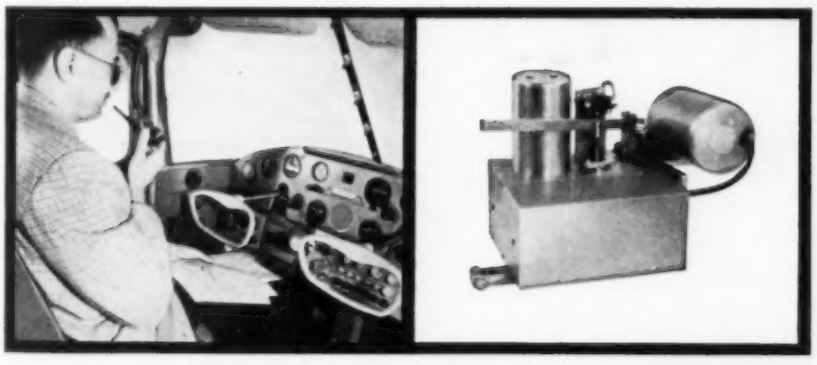
In a weight, horsepower and price category all its own, the $54,950 Model 310 is neither the smallest nor the

Trans-Atlantic Cessna 310

Among several Cessna 310's which have been flown to Europe is this one ferried to Bill Lear, Sr., the electronics wizard, now residing in Switzerland, by his son, Bill, Jr., of Howard Aero Service, San Antonio. He carried 150 gals. of extra fuel for 250-gal. total and had at least 4 hrs. of fuel aboard at each stop. Most completely radio-equipped 310 yet, his plane had Lear L-5 autopilot with navigation coupler as well as automatic approach coupler.

largest of the light twins. A definite design philosophy made it that way. We asked the Cessna factory to express this design philosophy and here's the official statement: "Our philosophy on the 310 has been to build a comfortable 5-place twin-engine airplane that one man could handle on the ground, yet it would have the highest performance. It would be simple to fly and have a single-engine service ceiling of at least 7,500 ft. and could be flown by any average single-engine pilot from the smallest community flight strips. Frankly, we think we have come up with an outstanding airplane based on what we started out to build."

Our trip in the 310 proved that it is a genuine 200-mph. airplane at economical power settings. Its single-engine ceiling is well above 7,500 ft.



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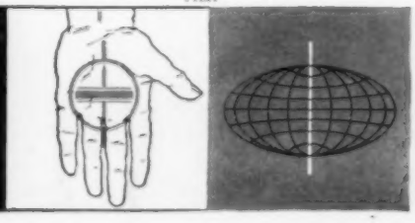

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Questions and Answers for Operators

Leases and the Master Plan

As is the case with many of the subjects discussed in this column, this subject assumes interest not from a direct question addressed to FLIGHT MAGAZINE but from recurring references to difficulties in the general area of the subject.

We recall a gathering of airport managers in a room at a Norman Conference several years ago. One of the younger managers made reference to his worst problem as one he had inherited from leases executed prior to his tenure as manager. Principally, he was concerned with leases, some of which had been drawn up ten or twelve years before. His particular beef arose from the trouble those old leases gave him in attempting to set up an orderly and realistic income structure.

During the discussion one of the other managers in the room voiced a comment that was remembered and which gives rise to this month's column. He said "Wait 'til you see what those leases do to you when you try to lay out a real master plan." Since that time we have seen instance after instance bearing out that observation.

We've heard many a snide remark about master plans with inferences that such plans were made only to be changed or to provide the Chamber of Commerce with a pretty picture of something that didn't exist. Yet every time you see a hangar or other structures being moved or removed to make way for needed terminal, runway, taxiway or apron construction, it's a lesson on the failure or the absence of master planning. It is also true that master plans made in the thirties and forties are no longer desirable. Some old master plans showed parallel runways in several directions for airports where parallels may never be necessary. Advances in design have made changes to a one-runway plan possible in many locations. And that one runway may not be on the heading of any existing runway. Newer, heavier and faster aircraft are extending needs in length and design of runways.

With changing conditions and increasing requirements it is true that changes may be in store for any master plan. However, there is one principal purpose in a master plan which, if adhered to by the planner, will make such changes easier to accomplish and will not require entire revision and destruction or movement of structures. That principal is one of forming a plan which will permit expansion and serve as a guide for keeping the way clear for such expansion when it is necessary. That brings us to the ef-

fect that leases have on master planning.

If long-term leases on land or structures have been made without reservations of some sort before a reasonably sound master plan has been established, they may have a direct effect on efforts to design an intelligent master plan. If leases which are made on an airport after a sound master plan is made are allowed to encroach on or interfere with the expansion forecast in that plan they have the effect of nullifying the plan. If such leases have to be brought up or privately owned structures on leased land have to be acquired by purchase or the expense of moving be borne, the cost of necessary expansion may be excessive.

The foregoing doesn't mean that long-term leases should be ruled out. It does mean that the first consideration of any long-term lease should be its location with reference to areas to be kept clear in the event expansion is likely and recognized in a realistic master plan. In some instances final decision on such leases may not be possible until a master plan is restudied. There is no question that some types of leases which contemplate considerable expenditures on the part of the lessee require long terms in years. The longer the term the greater is the requirement for careful selection of location.

Not infrequently the placement of reserve or national guard facilities on civil airports contemplates fifty years or more of occupancy and that requires very careful study of the location with reference to the master plan.

It is much better from an economic standpoint to keep the way clear for orderly growth than to attempt to set up machinery in a lease for the eventual acquisition or removal of improvements in the event expansion requires the area. That will usually cost somebody money.

Model Hangar

One of our roving friends sat down at our table in the Meacham Field restaurant at Fort Worth last week and told us we ought to take a look at the hangar at Brownwood, Texas. He said it was clean and well-kept, clear of gear and spare parts; all in all, a credit to the operator and the City.

Sounds in the Night

Speaking of airport restaurants reminds us to write a letter to the director of one of our newest and most impressive terminals. It will be a letter of complaint. It was something that happened at 5:40 in the morning in the airport coffee shop. We were waiting for our coffee and hot cakes prior to departure on an early American aircoach flight. Only one U-shaped section of the counter was open and it was peopled by eight or nine sleepy-

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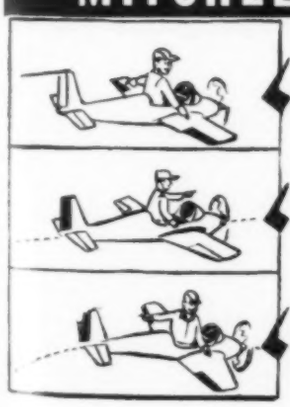

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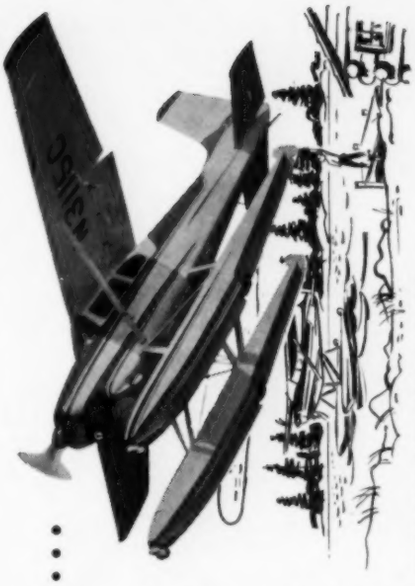

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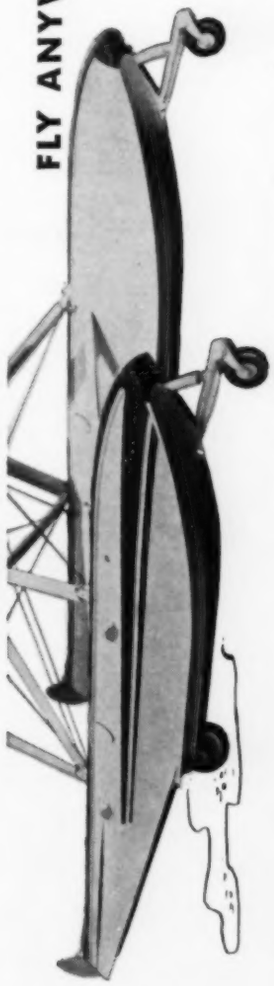

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looking men and one blonde. All was very still, even the waitresses being too tired to chatter. Only the occasional slurp of coffee and the muffled plunge of a fork into a fried egg marred the serenity.

Then the blonde got up and started out. Unconsciously our eyes followed her and the rest of us turned, too. The minute the movement was communicated to the counter stool and it began to turn, it let out a screeching squeak that woke up everybody at the counter. In the stillness it was as loud a scream as if we'd pinched the blonde.

It seems to me there ought to be a superintendent of trivial maintenance at that airport to prevent such embarrassment by inspection of all moving parts, at least occasionally.

Bulletin Board Calendar

Bill Fuller came up with a new one the other day. At least it was new to us. In the lobby at Meacham Field, which is active as a base and stopping point for executive, business and personal aircraft, he has placed an Aviation Events Board which carries by date future conferences, meetings and air tours to remind aviation people of things not to be missed. Good idea.

THE TWIN-TURBINE YH-16A TURBO-TRANSPORTER HELICOPTER crashed last month during a test flight, with loss of Harold Peterson and George Callahan, experimental test pilots.

SERVICE GUIDE FOR FLIERS —

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Work in Progress

Currently, Temco assembly lines are working on components for the **F-100, F-101, B-52, B-47, F-84, C-123, F7U, F3H** and others.

Temco designers are in the middle of work on additional components for the Lockheed Electra and several other aircraft, plus some design projects of their own.

Interesting.

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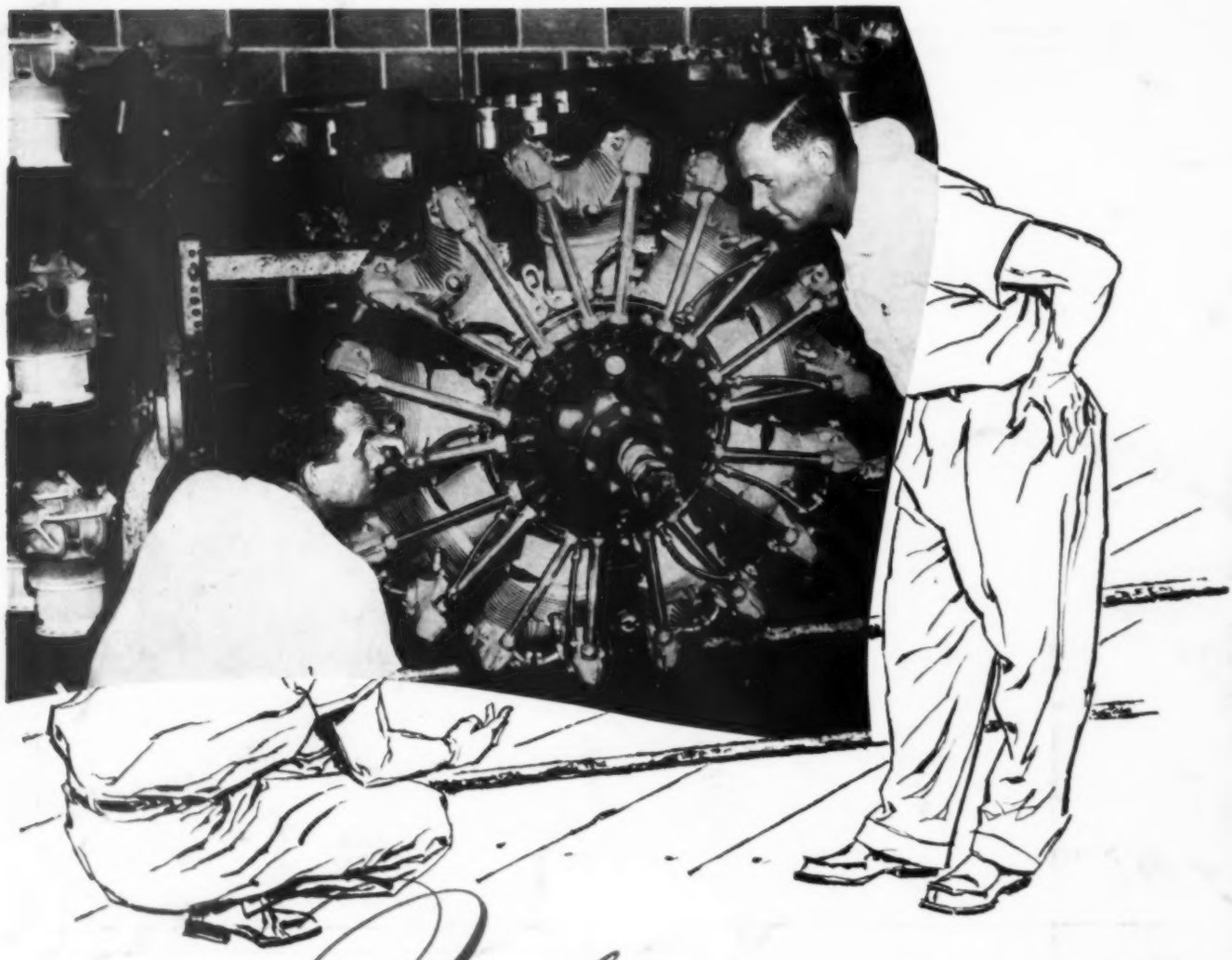

"*Quality* is a positive property"

YES, *Quality is a positive property* when your airplane engines are overhauled in the modern and complete shops of Dallas Aero Service. It's the Quality of workmanship; the Quality of facilities; the Qualities of new and overhauled parts that all go together to make engine overhaul at Dallas Aero Service the finest possible.

YEARS of experience in overhauling all types of Pratt and Whitney, Wright and Gypsy Queen engines is the record of DAS. Dallas Aero is one of seven authorized Wright engine overhaul installations in this nation — specializing in the 1820. DAS is the nation's only authorized engine overhaul agency for the deHavilland Gypsy Queen engine. For engine overhaul on those having up to and including 2,000 horsepower, it's Dallas Aero Service.

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